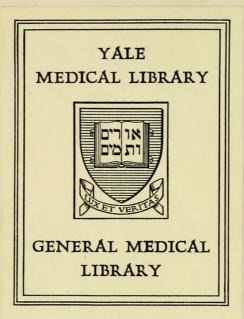
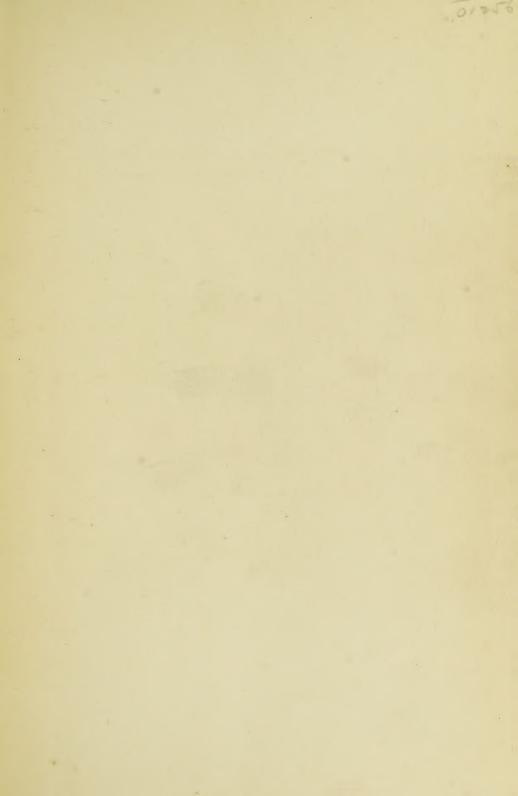
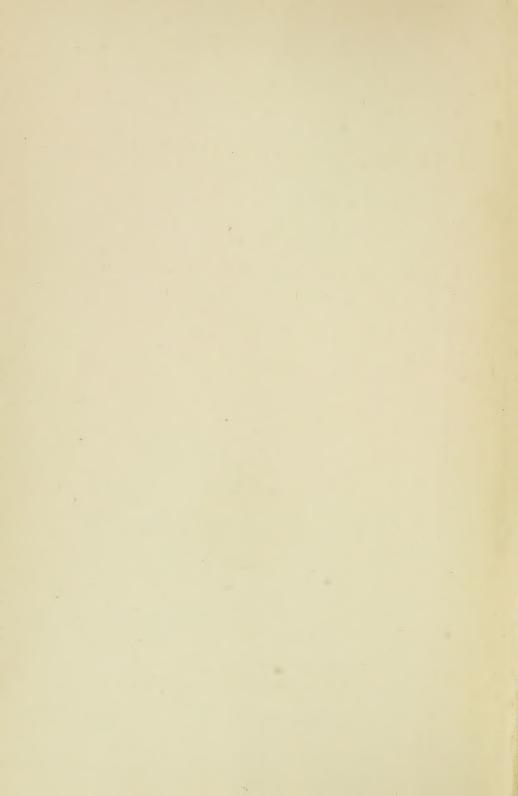


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THERAPEUTICS

OF

INFANCY AND CHILDHOOD

A. JACOBI, M.D., LL.D.

THIRD EDITION



PHILADELPHIA & LONDON

J. B. LIPPINCOTT COMPANY

1903

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THIS BOOK, IN ITS THIRD EDITION, IS
AGAIN INSCRIBED TO MY FRIEND AND
LATE CHIEF OF CLINIC

DR. FRANCIS HUBER

IN DUE APPRECIATION OF HIS VALUABLE
AND UNREMITTING SERVICES RENDERED
THESE TWENTY-FIVE YEARS (UNTIL THE
LAST HOUR OF OUR COMMON LABORS)
TO ME, TO THE COLLEGE OF PHYSICIANS
AND SURGEONS OF NEW YORK, TO OUR
STUDENTS, AND TO NUMBERLESS CLINICAL
PATIENTS

"Die Frucht der Heilung wächst am Baume der Erkenntniss. Ohne Diagnostik keine vernünftige Therapie. Erst untersuchen, dann urtheilen, dann helfen."

C. GERHARDT.

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PREFACE TO THE THIRD EDITION



The past four years have not added very much to pedology as a special science and art, notwithstanding greatly increased literature and the contributions of many men active and well known in general medicine and pediatrics. The much-discussed subject of infant feeding has enjoyed its universal interest, as formerly; no unanimity of opinions, however, will ever be reached so long as infants insist upon being individualities. The author finds no reason to change to any great extent his convictions as laid down in previous editions on many questions connected with that subject; after all, the soundness of a man's teaching is best demonstrated by the soundness of infant digestion and the number of living and healthy children.

In this revision I have made many additions to my book, but no actual changes in its general character. The profession seems to have approved of my attempt at founding therapeutics on etiology. Their connection I have tried to make still closer, and the reader will find that in a concise manner much that belongs to pathological anatomy, etiology, and diagnosis is utilized in the interest of treatment. In this way the book, I think, is a comprehensive treatise on "theory and practice," the former being the foundation of the latter.

To those who offered available criticisms of former editions, and principally to those who by their writings during these few years added to my knowledge and suggested new thoughts, I herewith beg to express my best thanks. These are mainly due to the fifty-three gentlemen who contributed to the Festschrift published in my honor more than two years ago. Indeed, I know of no collection of fifty-three monographs on scientific and practical subjects, almost all directly connected with pediatrics, of equal value. It has been, as this book will show, a fruitful source of information to me, besides being the greatest honor that ever was conferred on me or on any other man. To all its contributors, both in this and in foreign lands, mainly to those whom I have not thanked in person, I take this opportunity of again expressing my heartfelt gratitude.

A. JACOBI.



PREFACE TO THE FIRST EDITION



Mucu of what is contained in this work may be claimed as common property. Much of it I have taught before. Indeed, very few books can ever be written that will be entirely new. Pediatrics is not new to-day; nor was it so when, in 1860, I established the first systematic course, in our country, of clinical instruction in the discases of children. Having since that time appeared before the medical public with essays and monographs only, I was repeatedly reminded by friends of my obligation to submit to the profession which has afforded me so many facilities and advantages a compact picture of the therapeutics of infancy and childhood as I have it in my mind.

A large part of this work is devoted to diet and bygiene, a good deal also to the consideration of the action of medicines. For, indeed, I believe in medicines. Advancing years and experience during a period of increasing canetness in medical methods have rather strengthened my belief than otherwise. What the knife is to the surgeon, drugs are to the physician. The knife does not make the surgeon, nor do medicines make the physician; both, however, are indispensable. To employ them with benefit takes skill and experience, both individual and collective, as also judgment and honesty.

Indications for the administration of medicines are furnished by etiology and symptomatology. Both of these occupy a prominent place in this book. Without a diagnosis of the morbid process and of its evolution, and without the appreciation of its influence on the patient, no rational therapy can be thought of. Consequently I have taken particular pains to offer clear, though brief, statements of differential diagnoses.

I have tried to write a book for those who are sufficiently prepared by previous studies to build their therapeutical measures on the foundation of an exact recognition of the conditions they have to deal with. It is intended for those to whom neither the principles of diagnosis nor the facts of materia medica are mysteries. Therefore, I have abstained from ornamenting my pages with numerous recipes. While aiming at accuracy in dosing, I have trusted, as regards the actual writing of prescriptions, to the knowledge and intelligence of the reader. On account of our present period of transition to the metric system. I beg to be pardoned for alternating the old method with the new

In view of what I have included within the frame of this volume, it might almost claim the name of text-book. I prefer, however, to call it therapeutics only, intending to emphasize the fundamental truth that everything in medical science, in order to be both scientific and humanitarian, should be conducted to the prevention or to the cure of disease.

The preparation of this book has extended over a long period. The first essays embodied in it were published in the Archives of Profintries of 1888. As a consequence the reader may discover occasional incongruities, which, however, he will find to be more those of style than of matter.

A. Jacons.

110 West Timers-Foreign Street, New York, October, 1895.

PREFACE TO THE SECOND EDITION

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This revision of this back was begun immediately after its publication. The criticisms of reviewers and of correspondents have been carefully considered and taken advantage of. The final composition of the work as I now offer it represents the labor of a few months. In this way the drawbacks, resulting from the fact that the book which was commenced in 1888 was not published until 1896, were avoided.

Some of the chapters are entirely rewritten; a few new ones are added; there is hardly one that has not been somewhat enlarged or otherwise changed. Indeed, every page has been scrutinized. In order to adapt the book more to the wants of the practitioner I have, while still adhering to the general views expressed in my former preface, been more explicit in the discussion of doses of drugs, and have added to the text a munifer of prescriptions. Altogether I has o tried to avoid verbosity, to condense my teaching in as few words as possible, and thus, while conveying knowledge to the beginner in a most concise shape, to offer the will-informed medical man a repertory of the science and art of modern poliatrics, with the addition of my own views and experience. The remark made by critics, that the book is a personal one, I wish to deserve.

A. IACORE.

December 16, 2007.



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THERAPEUTICS

OF

INFANCY AND CHILDHOOD

I

Feeding of Sick Children

Discretics should be considered a part of therapeutics. The two must always go hand in hand. Ancient physicians knew the fact that numy diseases are removed by a correct mode of living and matrition; and the men who established therapeutical schools on certain positive principles or on preconceived ideas arranged their dietetical and their medicinal and surgical rules on the same basis. Thus, Broussais, among others, while he purged and bled, crowned his work with starvation to such an extent that Graves, in 1843, had to come forward with the declaration that the systematic starvation of the disease unded in the destruction of the patient. It was Chossat, finally, who proved that manition had many of the symptoms of fever, and that a starvation diet was liable to increase the dangers of an illness.

Still, there are no universal rules for feeding, as there are none for medication. There are, however, certain indications which can always be fulfilled in the treatment of individual cases. As intellect and knowledge are required for finding these indications, so there is need of fact and experience to apply and fulfil them. Some of them are plain enough. It is clear that in conditions of great debility there must be no further reduction of strength; an irritated cerebrum should not be excited; hemorrhages, peritonitis, dysentery, perityph-litis, require absolute rest; a hyperasthetic stomach must not be overfed; a gastro-enteritis resulting from the presence of ferments should do without milk; convalescence should be shielded and acute inflammatory fevers guarded. Still, there are chronic fevers with fair digestion which permit of generous feeding. All these indications and rules are equally valid for both the adult and the young. But

the latter have some peculiarities which after the application of general rules to a considerable extent, for several reasons. Of these I shall mention but a few at this time. Habits, which play an allimportant part in the mosology of adults, such as alcohol, narcotics, sexual abuses, are not observed-unless very exceptionally-in the child. Cardiac debility, which is the constant danger of the smile period, and a frequent one in the adult, is in the beginning of a morbid process not so frequent in the very young, partly because the heart, compared with the nest of the body, is larger and more powerful, and partly because it has not had so much time and opportunity to become discased. On the other hand, general metamorphosis is very rapid in the young, because both of the rapidity of the vital processes and of the constant necessity of adding to the tissues of the body, heades keeping up the equilibrium. Therefore manition through insufficiency or incompetency of food is not tolerated for a long time. The very fever referred to above appears to depend on the absorption and elimination of alluminoids, both those which are stored in the tissues and those which are circulating in the blood, and of the disintegrated carbohydrates. Thus the child cannot long remain without being fed, and, therefore, its digestive organs require pernument attention. Their physiology must be carefully studied both in the bealthy and morbid conditions. What the child eats is important, but of little consequence compared with what it digests. Nor are its subjective sensations the proper guides for the selection of loods or for the times of feeling. It is not always true that when there is no appetite there is no digestion. Nor are the panes of hanger or the temptations of whimsical cravings safe counsellors. Not does the condition of the tongue, to which we are upt to turn as one of our advisers in many of the adments of the adult, deserve the same confidence in the young, for the frequent local processes. in their oral eavities are upt to mislead us in regard to their significance.

The feeding of sick infants and children must be a modification of their normal feeding only, in the same way that their allatents and diseases are only modifications or changes brought about by abnormal influences in their physiological conditions. That is why the question of normal feeding for both infants and children should be the first to be answered. Then only the duty of altering the normal food to meet the requirements of aberrations from the usual healthy condition is to be taken into consideration.

For the newly-born and the infant the proper food is his mother's rolls, if any be secreted, both in health and illness, or the milk of

some other woman if there be no mother or no maternal breast. always provided it agrees with him. For miles are not identical. A baby may thrive on the milk of one woman and not on that of another; and the constituents of woman's milk are only "more or less constant" (Monti). Johannessen and Wang (Zritsch. J. phys. Chemie, vol. xxiv.) found in breast-milk the following differences: albumin 0.9 to 1.3 per cent., fat 2.7 to 4.6 per cent., sugar 5.0 to 7.55 per cent. They also found the amount of sugar to be less, but that of albumin and of fat larger towards the end of mursing, and the fat to reach its minimum in the course of the night. Indeed, the tensof thousands of recorded analyses of woman's milk are contradictory; no two are alike. Besides, a woman's milit will change during nursing from minute to minute, from morning to night, by variety of food, state of health, menstruation, lactation, emotions, etc. But, after all, human milk is the food for the human young. Modifications, however, are indicated during illness. As a rule, the quantities of food supplied during illness should be less because less is digested; feverish diseases require less substantial food and more water; in fact, water may have to replace the former altogether temporarily; indeed, there are conditions in which even woman's milk is not borne at all. In gastritis no food and no water are tolerated; in enterocolitis milk may not be permitted, and cereal decoctions or a mixture of egg albumin and water may have to take its place.

Such and similar changes, if required even for those who are fed on the most normal substance, are demanded when artificial feeding has to take the place of breast-milk. Now, the majority of our babies are in that position, either from birth or soon after, and the question of the methods of procuring the most advisable food for infants has for that reason engaged the anxious attention of the profession. Whatever is the best artificial food in health is the best in disease, with such modifications as are required by the changed physiological conditions.

No artificial food for the infant can be thought of except the milk of some animal,—viz., the cow,—which is the only one that is accessible in the vast majority of cases, with the exception of the goat, or the ass, in some localities. That is why a brief consideration of the physical and chemical properties of cow's milk, compared with those of human milk, should procede the discussion of the mode of its administration, whether pure or mixed or modified.

The differences between the casein of woman's and of cow's milk have been studied extensively since Hammarsten (one-third of a century ago), but to this moment it is not clear whether the albuminoid which is found (more in the woman than in the cow), besides casein, is coordinate to it or derived from it, and the result of disintegration, Kopik even asserts that woman's casein contains an additional albuminoid which is not identical with either the known casein or albumin (N. V. Med. Joan., April 13, 1893). In Immumed Munk's opinion (Virels. Archiv, vol. exextiv.), the part played by nitrogen in the albuminoids of woman's and cow's milk is different. There is more systomin in cow's milk casein and more lime (6.6 per cent. compared with 3.2 per cent. in woman's milk—Lehmann), more phosphorus in woman's milk (0.84) than in cow's milk (0.08), less sulphur in woman's milk (0.75) than in cow's milk (1.11). "Lah" ferment congulates cow's milk in coarser lumps than it does woman's milk, and the nature of this congulation depends also on the introduction of milk-sugar, of fat, of sodium chloride, or of dextrinized or other flours.

According to Schlossmann, of the alluminoids in woman's milk sixty-three per cent: are casein, thirty-seven per cent: lacto-albumin, which being directly absorbable constitutes an essential difference from cow's milk; all of the latter has to be transformed during the digestive process before it can be assimilated.

The casein of woman's milk is not so easily thrown out by acids for instance, lactic acid or salts—as that of cow's milk, and is more readily dissolved in an excess of acid. Some years ago Wroblewski demonstrated the difference in solubility of the two milks. Woman's casein retains, during pepsin digestion, its nuclein (proteid rich in phosphorus) in solution: it is fully digested; in cow's casein the nuclein is not fully digested: a "parametein" in deposited undissolved and undigested.

K. Wittmark and M. Siegiried published tately (Zeitzch, f. phys. (Nem., vol. xxii.) their ussays on the nucleon (the phosphoric acid of muscle) in the milks of cow, woman, and goat, and on phosphorns in the milks of the cow and the woman. Their conclusions are accepted by E. Salkowski as correct, which, I should say, proves them to be so. Cow's milk contains 0.057, goat's milk 0.120, and weenan's milk 0.124 per cent. nucleon. In cow's milk the phosphorus of the nucleon amounts to six per cent. of the total amount of phosphorus contained in the milk; in woman's milk 41.5 per cent. That means that in cow's milk not one-half of its phosphorus is in the organic combinations of casein and nucleon; in woman's milk almost all of it. In cow's milk the phosphorus not utilized for organic combinations is contained in the inferior phosphates. E. Salkowski adds the following remarks: "These conditions are evidently of the greatest moment

in the nutrition of the nursling. As the development of hones is more readily accomplished in nurslings fed on woman's milk than in those fed on cow's milk, the probable conclusion is this: that nucleon has an important part in the absorption and assimilation of phosphorus. The same should be said of calcium, which also combines with nucleon. Though woman's milk contains less calcium than cow's milk, more calcium is utilized out of the former, and the nucleon is evidently an important factor in its absorption also."

A certain amount of par is digested even in fevers of moderate severity, thus also in typhoid fever. But it is a good rule to rather reduce its quantity, because when infants were fed on now's milkduring capillary bronchitis, the fat in the faces amounted to forty per cent, of the solid constituents. A few additional remarks will render the subject clearer, and show that it is very easy to give too much fat.

Infant faces are comparatively copions, although the baby receive absolutely nothing but mother's milk. What has been called detritus in the faces is not exclusively undigested casein, but principally fall and large masses of intestinal epithelium; for this so-called detritus is not soluble in water, acids, or alkalies, but quite soluble in alcoholand other. Casein is present only when it has been taken in too large a quantity, or when there is too much free acid in the stomach. In those cases there are large quantities of it in the fieces. The normal faces of the infant, according to Wegscheider, contain nine per cent. of fat; according to Henbner, nearly six per cent; according to the same authority, the infant with "weak intestines" would expel fifteen per cent. of the fat introduced into the stonnels. Besides, W. Knopfelimicher (Wiener wed, Wock, No. 30, (897) found that the fat of the faces of the adult and advanced child while they were fed on milk consisted of from twelve to twenty per cent, of olein, of which the larger portion came from the digestive juices, the smaller from the malsorbed fat of the milk. The fecal fat of the nursling, however, contained from 28.8 to 37.8 per cent. olein, only five per cent. of which was due to the digestive inices; all the rest belonged to the unabsorbed milk fat. Thus, we may conclude that the latter is less utilized by the nursling than by the adult.

One of the reasons for adding fat (cream) to cow's milk to make it a more appropriate food for the infant was its alleged low percentage in fat. Still, in a large number of analyses, though they differ ever so much, the percentage of the two milks is by no means very cissimilar. Söldner has 3.28 per cent, of fat in woman's milk; Marfan, who draws the average from the results of a number of analytic chemists, gives us 3.7 per cent. for cow's and 3.8 per cent. for woman's milk. In the face of such facts the addition of fat (cow's cream) to cow's milk to make it more similar to woman's milk does not appear very rational.

Moreover, the fat of cow's milk effers from that of woman's milk. The latter has more ofeic acid, less volatile acid than cow's milk; woman's milk holds its fat in a finer emulsion and contains from two to four times as many fat-globules as are counted in equally fat cow's milk (Schlossmann). This condition makes it more digestible: it is assumed, and reasonably so, that the fine fat-globules may be absorbed directly through the epithelia or of the intestinal willi. Moreover, cow's milk fat undergoes changes before it is used. When cream is taken after slow rising it is apt to acidnlate, when sterifized and centrifuged it is changed chemically and physically, when frozen it separates from the milk and does not mix again.

All of these facts and considerations and the low percentage in fat of ase's milk, which was known to agree best with nurshings and to be inferior to woman's milk only (according to Verneis and Becquerel's analyses made fifty years ago), have led me to reduce rather than to increase the fat of cow's milk used for infant feeding. I meet with no fat diarrhosa and no excessive acidity when habits are fed according to that rule.

H, you Ranke's recent favorable experiences with ass's mile (Festschrift in honor of A. Jacobi, New York, 1900) administered to young infants, one of whom did not thrive at all previously. Klemm's report (Dresden, 1898) on ass's milk employed for two or three months, Marfan's corroborative opinion ("Allaitement," p. 299), and the earlier results of Parrot and West leave no doubt as to the favorable effect of ass's milk, with its low percentage of fat, at all events in the first few months of infant life. Ass's milk is digestible and wholesome not in spite, but because of its low percentage of fat, and in spite of its albuminoid being contained in larger quantities in ass's than in woman's milk."

What is proven for babies in the first months I also claim for older infants. For them some fat may be added to ass's mile, perhaps, while the stools are being watched for endigested erram, but

According to Broge (Phys. Chemic, 4th ed., 189); there is in the milk of

	The cont.	Per cent	Per treat.
Abunimid	17	3.3	23
Pat		37	1.6
Adle	0.0	0.7	0.5

I know that they do better with less far than moder the influence of laboratory analyses, no two of which are alike, is generally considered their due. I insist that a series of clinical observations made prudently and critically and extensively must and will be esteemed as equivalent to the results of measures and scales and microscopes; I say equivalent, neither superior nor inferior, for there is no more virtue in the limited and boastful experimenter than in the one-sided and narrow practitioner. That is why to me it has been a source of great satisfaction to notice that in the writings of the last few years clinical experience is frequently appealed to and called in as evidence; and from that point of view I again appeal to the medical profession to revise theories and practices that I firmly believe to be wrong and dangerous.

An important practical application of this fact is the following. As it is true that fat is not completely absorbed, even under the most normal circumstances; as free fat acids are so easily formed and accumulated; as they are found in moderate quantities, even in healthy bubbles; as a simplifies very apt to derange digestion and assimilation and prevent the normal secretion of either of the digestive fluids; as there is a superabundance of fat in the normal food of the nursling, the conclusion is justified that we should be very careful in preparing foods for the healthy or sick. It is very easy to give too much fat. It is hardly probable that there is too little.

V. and I. S. Adriance have succeeded in proving, by exact chemical and clinical researches, some facts which were known, but perhaps not sufficiently appreciated. Both excessive fats and proteids in the milk of the mother may cause gastro-intestinal symptoms in the nursing infant; the former may be reduced by diminishing the nitrogenous elements in the mother's diet; the latter by the proper amount of exercise. Excessive proteids are especially apt to cause gastrointestinal symptoms during the colostrum period, and particularly during that of premature confinement, when their percentage is higher. Premature infants are, therefore, in particularly great danger, and their food ought to be greatly modified and watered.

Under the head of "Fat Diarrhota," German journals and a few text-books speak of a diarrhota the chief characteristic of which is the presence of a large quantity of fat in the stools.

The normal faces of the newly-born exhibit ten or twelve per cent, sometimes more, of fat. In almormal cases, even when the food does not contain it, the faces may show from forty to seventy per cent, of far.

In serious cases the microscope reveals fat, almost to the exclu-

sion of everything else, sometimes pure, and other times in more or less regular needles. The amitomical condition in fat diarrhosa may vary, but in the majority of cases we have to deal with a simple entarrh of the intestinal tract. There are changes in, and exioliation of, the epithelium of the small intestine, swelling of the micous membrane of the diodenium, with obstruction to the flow of the secretions of both liver and pancreas, and such hyperplasia of the measureric lymph-bodies as to impede the absorption and circulation of chyle. Finally, in a very few instances, anatomical changes were found in the pancreas resembling those which in the adult interfere with the emission of fat. In such cases the use of pancreatin appears to be indicated.

No improvement is possible unless the quantity of flat contained in the food be largely diminished. The administration of cream and the nontine treatment with cod-liver oil are equally injurious in these cases; for even normal digestion disposes only of a limited quantity of fat (cream, butter, cod-liver oil); twenty-five per cent, of it in the food, as lately recommended (Breliver Minische Workenschrift, June 14, 1897), is excessive. One of the preparatory stages of its assimilation is the formation of oleic acid; lipanin, which has been recommended in place of cod-liver oil, contains six per cent, of that acid, the physiological preparation of which the body is spared by its administration. There may be very few conditions in which the digestion is so low as not to insure the required transformation, but in chronic dyspepsia of different sorts fat is badly digested and absorbed, and lipanin may take its place.

An excess of fat in infant foods is considered faulty, if not dangerous, by almost every author, though Schlossmann pronounces the belief in the injuriousness of fat to be "antiquated." (Nor is the assertion of Voit, that the earbehydrates, by their power to present the loss of fat and allumin in the tissues, may take each other's places, so that fat, sugar, or sweets could be mutually sehstituted, justified by experience.) What I have wished to impress, however, is that an apparent lack of cow's milk cream is by no means a fault. Practical experience proves its good results, and its low percentage in a mixture which is greatly diluted is in reality only apparent. The diluting element is mostly water, which when containing salts and sugar is readily absorbed even in the stomach, and for that reason is no disturbing element in the relative proportion of the constituents of the artificial food.

Infants' food ought to be mixed with large quantities of water, not

for the sick only, but under ordinary circumstances. In diseased conditions of the stomach when pepsin and hydrochloric acid are wanting the free dilution of children's nourishment with water is demanded upon the following physiological facts. Only to a certain limit, if at all, will pepsin be furnished for digestive purposes. Probably a portion of this is not entirely utilized, because a great quantity of water is necessary to assist in pepsin digestion. In artificial digestion albumin often remains unchanged until large quantities of acidulated water are supplied. Without doubt many disturbances of digestion are to be explained by a deficiency of water, certainly many more than are due to an apparent excess of it, for the latter, particularly when containing salts or sugar, is speedily relieved by rapid absorption.

For the reasons given, I advocate under all conditions a plentiful addition of water to children's food. As a general observation, I would by stress upon the fact that, as a rule, small children receive water only as they get it in their milk or milk food. Afike in summer and in winter, it is probable that the fact seldom occurs to a mother or marse that a child may be thirsty without being hungry at the same time. Certainly, many a discomfort and even sickness in a child is conditioned upon the fact that it has been compelled to cat in order to satisfy its thirst, and often has to suffer thirst because the overstimulated and injured stomach will take no more nourishment at irregular and too short intervals. There are even normal products of digestion that are capable of disturbing the digestive process, thief among which is peptone itself, which is not absorbed unless it be greatly diluted. That is why I, when preparing the rules for the feeding of children, which the New York Health Department annually published and distributed through several decades, insisted upon giving infants, who cannot ask for it in so many words, an occasional drink of water, particularly during the bot weather. When there is the least ground for the supposition that the drinking-water is coutaminated with germs of disease, or when it is unusually hard, it should be boiled before its admixture with children's food, whether the diet he milk se a mixed one. In general it will be most sutisfactory to give very young infants boiled water as a matter of course, even though there be no apparent orgency for it.

There are many other indications for the administration of water in the diseases of the young. In many morbid conditions it is wanting. Perspiration, diarrhou, general inanition, feverish diseases, diminish its quantity in the tissues and in the blood-vessels. Thus an inspissation of the blood takes place; thromboses form in the small veins of distant parts or the viscera; in the brain they lead to convolsions and defective innervation (hydrenosphaloid), in the limbs to orderna or gaugeste. The remedy is mater in sufficient quantities. When the stomach rebels, the lungry lymph-ducts of the recrum will greedily absorb an onnce or much more, injected every hour or two. In many a case life is saved in this manner. In extreme cases the subcutaneous infusion of a sterilized salt-water solution (6 to 1000) is required. From two to six hundred cribic centimetres (six to twenty ounces) will readily be absorbed in the subcutaneous tissue.

When general metamorphosis is slow, unter in abundance increases the elimination of area and carbonic acid. When the urine is scanty and of too high a specific gravity, water protects the kidneys from undue irritation. It acre on the micous membranes as it does on the external integuments. In laryngitis and beoneficis it liquefies viscid expectoration, in many forms of constigation it nets beneficially hy increasing the secretion of the muciparous glands of the intestines. Ice and ice-water, or iced carbonated water, in small quantities, but frequent doses, relieve hyperaesthesia of the stomach and stop womiting. Warm water acts as an emetic, but water injected into the rectum combats collapse. In connection with this subject, however, I may allude to what good may be done by abstinence from water. In some forms of acute gastro-enteritis, where vomiting and diarrhora are excessive, the only salvation is in total abstinence for from four to eight or ten hours. Not infrequently the turning-point in the course of the threatened danger dates from the commencement of what appears to be cruel starvation.

A regular addition to the milk food of infants and children is that of sugar. Its percentage in the milk of the woman, ass, and more is larger than in that of the cow. Immediately after the milking of the cow the milk-sugar begins to change into factic acid. This process. after remet has exerted its congulating effect, together with the gradml conversion of fat into acid, is the final cause of cardling. The large amount of sugar (after the first week of life) in woman's milk. together with its smaller percentage of casein (about one per cent.) and butter, gives it the peculiar blaish color and furnishes the colostrum of the first days after birth-which contains plenty of salts besides-its tendency to loosen the bowels. This property becomes manifest, sometimes under abnormal circumstances. Thus, in the milk of animic women sugar is occasionally found to an unusual degree. In their cases the other solid matters may, however, bediminished; still, this is not uniformly so. In such instances the infants are liable to suffer from obstinute diarrhom.

SUGAR 11

The conversion of milk-sugar into factic acid takes place very rapidly. Under its influence cow's milk turns sour at once. Not infrequently, however, it is acid from the first: it has been found to be so in the udder; in most cases it is "amphoteric," neutral. Thus the question arises what kind of segar is to be used as the addition to the food of children both well and sick, provided the milk-sugar of woman's and that of cow's milk be identical, which is very doubtful, and provided further that the milk-sugar in the market be not, as it frequently is, impure. That alone makes it desirable, or rather advisable, to substitute cane-sugar for milk-sugar if the former afford the same advantage. These four dozen years I have made this substitution. For their absorption is about as easy, even in the stomach, as that of dextrin, peptone, and salt solutions.

Most of the milk-sugar of the milk is changed into lactic acid by the bacterium lactis aerogenes and a number of other bacilli. When eight-tenths of one per cent, of the milk-sugar contained in the whole milk in the stomach is changed into lactic acid, no more lactic acid is produced. Ordinarily, however, this limit is reached when about one-fourth of the milk-sugar has been changed into lactic acid. If at this period, however, lactic acid be neutralized by an alkali. then more milk-sugar is changed into lactic acid. In this way the amount of factic acid present in the digestive tract depends on accidents only,-that is, mainly on the presence or absence of an alkali,-and it appears that in every preparation containing cow's milk that is selected for the use of an infant there is milk-sugar enough to supply the needs of the digestion of the whole ingesta. Moreover, a goodly part of the milk-sugar introduced, even in woman's milk. is eliminated unchanged, for Blanberg ("Studien über Sanglingsfaces," p. 55) found the nursling's desicrated faces to contain from 0.22 to 0.50 per cent, of milk-sugar. Escherich found that peptones which form in milk previous to normal absorption are destroyed by acid fermentation, and concludes that for that reason another earbohydrate should take the place of milk-eagar in order to avoid the excess of lactic acid.

It appears after all this that it is easier to give too much wilksugar than too little, and that the careful measuring and weighing of copious quantities of milk-sugar are of doubtful value, even if you know, or believe you know, that the milk-sugar you give and the milk-sugar of woman's milk are identical. Immediate fermentation in the intestine, moreover, should be carefully avoided for other known reasons. Lately Dr. Helen Baldwin has published (Journal of Experimental Medicine, vol. v.) investigations which prove the formation of oxalic acid as the result of intestinal fermentation. It appears, therefore, that my method of adding to the cow's milk mixtures destined for infants and children, not milk-sugar but canesugar, in moderate quantities estimated rather than anxiously weighed, was correct and justified by modern research.

Cane-sugar is not so easily transformed. Indeed, it is utilized for the purpose of counteracting the rapid conversion of milk-sugar and for the preservation of articles of food in general. Trade is not so slow in availing itself of the results of organic chemistry as the profession. Condensed milk remains unchanged a long time, on account of the plentiful addition of cane-sugar, in spite of the original presence of milk-sugar in it. That is why condensed milk, though not an ideal food or food constituent at all, is still a beneficent makeshift for something better among the hundreds of thousands in our large cities to whom good milk, or approximately good milk, is inaccessible. Many manufacturers of proprietary foods employ grape-sugar instead of milk-sugar, reminding us that every sugar is changed into grape-sugar. Cane-sugar is most accessible, serves the same purpose, and is of the same composition as milk-sugar (C,H,O, + H,O). Therefore it is not at all an indifferent mattre whether milk-sugar or cane-sugar be added to the food of infants and children. I have always insisted upon the selection of the latter for that purpose. Biedert employs cane-sugar in his cream mixture, Marfan sees "no inconvenience" in using it.

Joseph Prechtl (Jahrh. J. Kinderla, vol. lim., 1901) doubts the propriety of adding milk-sugar to infant milk, for the reason that it congulates the casein of the cow's milk. In the latter, casein is kept in solution by calcium phosphate, which is decomposed by factic acid. The result of this chemical decomposition is the throwing out and the congulation of casein. Normally, cow's milk contains three times as much casein as does human milk and much less mille-sugar. (3 to 5 or 6). In this relative proportion cow's casein remains in solution. When this proportion is disturbed by adding an undne quantity of milk-sugar to cow's milk (say as much as is contained in woman's milk) the lactic acid formed out of it makes its easin indigestible through coagulation. The proper quantity of milk-sugar (which is always insisted upon by professional dietarians) to go with a cow's milk mixture ought to be the relative quantity met in com's milk which keeps cow's milk in solution, and not the percentage of milk-sugar as contained in woman's milk which is in excess in its relation to cow's milk casein. It is only woman's casein that, though in a percentage three times smaller than that which is contained in

cow's milk, is not thrown out by its larger quantity of (milk-segarborn) factic acid.

All of which propes that the casein of the row and the casein of the woman are chemically different, and that the practice of adding the weight of milk-sugar required to keep woman's casein in solution is in excess of that which is tolerated by that of the cow.

In the sick the absorption of sugar is slower than in the healthy. Besides, during most diseases, particularly those of the alimentary canal, there is more almormal ferment in the mouth and stomach. Thus but little sugar ought to be given, and never in a concentrated form. Grape-sugar and dextrin are absorbed equally. Cane-sugar, according to Pave, is partly inverted into grape-sugar and partly absorbed. All appear to be changed, when given in moderate quantities, into carbonic acid and water, even during moderate fevers.

Large quantities of milk-sugar cause diarrhox; that is why it has been recommended as a purgative, and why dyspepties bear so much less of it than even the healthy. Cane-segar does not have the same effect to the same extent, but in that form of constipation of small infants which depends on a relative absence of sugar and superabmdance of casein in the breast-milk, the addition of sugar acts very favorably. A piece of loaf-sugar (a teaspoonful or less) dissolved in tepid water (or outmeal water) should be given before each nursing, and will often prove the only remedy required to regulate the bowels. On account of this gently purgative effect cane-sugar is frequently given by the attendants to the new-born in warm water or in some warm aromatic tea. Such a medication is rarely demanded, for mecomin is not often so solid or the mucus of the colon so inspissated as to require dilution. Still, there are occasional indications for interference. But A. Keller declares sugar to be by no means indifferent or uninjurious, and advises saccharin instead, " to which there can be no serious objection." Nothing but "tea" with saccharin should be given the first day of life, because "Jansen made experiments on newly-born ralyes with boiled milk, which almost always resulted in hemorrhagic diarrhoa" (1)

The physiological effect of sourca catasams is very important, no matter whether it is directly introduced through the mother's milk or added as a condiment to cow's milk or to vegetable diet. Both of the latter contain more potassium than sodium, and neither ought ever to be given, to the well or sick, without the addition of table salt. A portion of that which is introduced may be absorbed in solution; another part is, however, broken up into another sodium salt and hydrochloric acid. Thus it serves directly as an excitant to the secre-

tion of the glands and facilitates digestion. Therefore, during diseases in which the socretion of gastric juice is interfered with, or in the beginning of convalescence, when both the secreting faculties and the museular power of the stomach are wanting, and the necessity of resorting to nitrogenous food is apparent, an ample supply of salt ought to be furnished. The excess of acid which may get into the intestinal canal unites with the sodium of the bile in the duodenum, and assists in producing a second combination of sodium chloride, which again is dissolved in the intestines and absorbed. Its action in the circulation is well understood: it enhances the vital processes, mainly by accelerating tissue-changes through the elimination of more urea and carbonic acid.

A very important fact is also this: that the addition of sodium chloride prevents the too solid coagulation of milk by either remet or gastric juice. Thus cow's milk ought never to be given without table salt, and the latter ought to be added to soman's milk when it behaves like cow's milk in regard to solid curding and consequent indigestibility.

Habitual constigation of children is also influenced beneficially, for two reasons: not only is the food made more digestible, but the secretions of the alimentary canal, both serous and glandular, are made more effective by the presence of sodium chloride.

What is it that a sick infant or child ought to eat? That question is so grave because the roung when quite well are easily disturbed in their health by mistakes in their diet; indeed, the large majority of the diseases of infancy are those of the alimentary canal; and an error in their during the course of a disease is liable to prove latal. Advanced childhood is not so infangered; that is why my first remarks are due to infancy. If the literature dedicated to its physiological and pathological conditions were as profitable as it is copious, the gain would be immense by this time. For, indeed, the hygiene and the pathology and therapeutics of early age do not lack-contributions. Particularly the former, being the main prop and staff of infant (as of all) therapeutics, has roused the scal and industry of many workers, among them some of the very best of modern times.

In feeding the sick, no new principles until be sought for. The sick child is still the child, and the physiological laws hold their own under changed circumstances. No new articles of food can be discovered or invented, only the preparation or mixture of those in ordinary use may change temporarily, or a restriction in their number or amount may take place. Thus, I cannot undertake to give in full the methods of feeding infants and children. In several previous publications I have done so, and must refer to them. I will only repeat a few rules, leaving the reasons for them to the thoughtfulness or the recollection of the reader.

The principal sunstructes for breast-milk are those of the couand the goat. The mixed milk of a dairy is preferable to that of one cow. Cow's milk must be boiled before being used. Condensed milk is not a uniform article, and its use precarious for that and other reasons; still, to a great extent, under our present social conditions. imavoidable. Goat's milk contains too much casein and fat, besides being otherwise incongruous. Skimmed milk obtained in the usual way, by allowing the cream to rise in the course of time, is objectionable, because such milk is always acidulated. The caseins of cow's and woman's milk differ both chemically and physiologically. The former is less digestible. There ought to be no more than one per cent, of casein in every infant food. Dilution with water alone may appear to be harmless in many instances, for some children thrive on it. More, however, appear only to do so; for increasing weight and obesity are not synonymous with health and strength. A better way to dilute cose's milk, and at the same time to render its casein less liable to cougulate in large lumps, is the addition of decections of cereals or, as Biedert says, dextrinized flours (malt). It will be shown that a small amount of starch is digested at the very earliest age. But cervals containing a small percentage of it are to be preferred. Barley and cottness have an almost equal chemical composition; but the latter has a greater tendency to loosen the howels. Thus, where there is a tendency to diarrhou, barles sught to be preferred; in cases of constigation, catmeal. The whole barleycorn, ground for the pur pose, should be used for small children, because of the protein being mostly contained just inside and near the bask, and perlups also on account of its fair percentage of iron. The newly-horn ought to have its boiled milk (sugared and salted) mixed with four or five times its quantity of barley-water, the baby of six months equal parts Gum arabic and gelatin may also be utilized to advantage in a similar manner. They are not only diluents, but also, under the influence of hydrochloric acid, nutrients. Thus, in acute and debilitating diseases which famish no, or little, hydrochloric acid in the gastric secretion, a small quantity of the latter, well diluted, must be provided for. This, my method of infant feeding, which is suited to the stomachs and purses of the eich and poor alike, is, however, not the only one proposed and found satisfactory. No single method, indeed, is the only one, nor does it still every case. It is only an occasional chemist.

who expects the organic stomach to behave like a chemical reagent; clinicians, however, admit exceptions to the working of their rules and regulations, though their conception were ever so correct and physiological. Still, the endeavors to improve the diet of the young. and thereby to remove the dangers of intestinal disorders and the sources of excessive mortality and invalidism, are going on. Nothing has been more successful in that direction, in spite of such dangers as will be mentioned below, than a rational practice of sterilization and postenrization of cow's milk. Both are the logical development of the plan of treating milk by boiling which I have persistently advised these forty years at least, and detailed in my "Infant Diet." in Gerhardt's "Hamfluch," in Bock's "Hygiene," in "Intestinal Diseases of Infancy and Childhood," and in my clinical lectures delivered these more than forty years. There can hardly be a doubt that if raw milk could always be had madulterated, fresh, and mtainted, and as often as it was wanted, it would require no boiling. It would even contraindicate it, for high temperatures destroy not only some of the dangerous, but also those hacteria whose action is desirable for normal digestion. Besides, there are those who justly believe that boiling causes chemical changes. But such ideal milk can rarely be had so long as cows are taberculous, or scarlet fever and diphtheria are met with in the houses and about the clothing and on the lands of the dairymen and women, and typhoid stools are mixed with the water which is used for washing mensils.

Now, what is it that beiling can and will do? Besides expelling air, it destroys the germs of typhoid fever. Asiatic cholera, diphtheria, and tuberculosis, also the many hacteria which cause the change of mills-sugar into factic acid and the rapid acidulation of milk with its had effects on the secretion of the intestinal tract. Some varieties of protons and most of factorium coli are also rendered innocuous by boiling. Thus it prevents many cases of infant diarrhoea and vomiting, but not all of them, for the most dangerous bacteria are influenced neither by plain boiling nor by the common methods of sterification. Besides, "diarrhoea" is but a symptom of many causes, and "cholera infantum" is a name for a condition occasioned by

^{*}Page 38. "After boiling, milk descined for the me of a baby during the day should be kept in clean bortles containing from three 55 six sources. filled up to the cork, and the bortles then turned upside down in a cold place; such will keep longer than milk preserved in the usual way. Before being used it should be heated in a water-both; and by repeating this beating of the whole amount of the day's milk several times during the twenty-four hours. Fermentation will be retarded and digestibility improved."

many. Indeed, Ebstein emphasizes the fact that babies at the breast are subject to cholera infantum, porticularly in southern climates. also in public institutions. The influence of external temperature is a very important factor; its sudden changes presence intestinal thisorders. Bubies taken from a foot railroad car to the deck of a lake steamer, from a warm bed to a draughty room, or those that are kept outside their beds with wet diapers, may develop a catarrhal enteritis which disposes to worse forms of disease, for the morbid condition of the epithelium caused by such sudden changes is a proximate cause of disease because it opens the way to all sorts of infecting substances. Poisons in the food of cows, indigestible baby foods,-either indigestible for se or through a morbid condition of the digestive organs,-produce diarrhoza of many varieties. It need not even depend on ingested food, for, according to W. Schild's careful investigations (Zeitsch. f. Hyg. u. Infect., vol. xix.), since confirmed, germs of discussmay be found in the intestine of the newly-born in from ten to seventeen hours after birth (minimum four, maximum twenty). The meconium of the newly-horn, being free of germs, is supplied through the mouth with the bacterium coli, and through the anus with the bacillus fluorescens, subtilis, and proteus. Even adults are infected through the same inlet. Lines, the bath, the air, the blood, and perhaps more than anything else the hards of the nurse are sources of local invasion. In such cases what is the sterilization of artificial foods to accomplish? They are not reached by it.

Not even the natural food, breast-milk, is free of genus possibly attended by dangers. M. Cohn and H. Neumann found germs in the healthy breast-milk, even after the mamma and nipples had been washed with alcohol and with solutions of corrosive sublimate. A Palleske met with the staphylococcus pyogenes albus in one-half of all healthy women, F. Honigmann (Zeitselt, J. Hyg. u. Infect., vol. xiv.) in most of them, and H. Knocherstein (Irang. Diss., 1803) in the mammer of eight puerperal and sursing women. He thinks they had emigrated from ontside; they proved innocuous. But who can doubt that if the epithelium of the milk-ducts had been abnormal there would have been a chance for mustitis, or if the staphylococcic milk had come in contact with a sore stomach or intestine there would have been an opportunity for gastritis or enteritis? Many more observers have come to the same conclusions. Several species of cocci, particularly staphylococcus progenes allors, are found in most (perhaps in all?) specimens of the milk of healthy women. In that of sick women many more bacteria may be met with; for instance, arrencoccus allus, streptococcus pyogenes aureus (in mastitis by Cohn and Neumann), occus preumonia (in pneumonia of the mother by Fon and others). Pumperal women with fever had several bacteria in their mills (Escherich). Whether such milks are safe cannot yet be either asserted or demed.

Boiling, or sterilization, is by no means a safe protection under all circumstances. Aerobic factoria, the so-called hay or potato bacilli, have very resistant spores, which develop in time. They are found in cow-dung and in the dust of stables, of the soil and streets, and of bay; they render the milk strongly alkaline and bitter; they peptonize casein and liquely it and make the milk still more bitter. There are very poisonous; their pure culture gives young dogs a fatal diarthem. It takes bours of sterilization to kill them; in some instances it required free or six hours. Even the bacillus buttricus takes an hour and a half. But such a protracted sterilization, besides being far from certain in its effect, is a clumsy procedure and one not calculated to benefit the milk. Thus, hay feeding is an absolute necessity. if cows are to give a milk fit to be taken by babies, for by a six weeks" drying the bacilli are destroyed. Besides, it is important to keep the stables sermoulously clean, to avoid dirt and dust, to employ peat instead of straw for bedding, to wash the udder and tie the tails before milking, to throw away the first milk, and to remove foreign material from the milk by filtering. Centrifuging for that process is not safe, for it may change the character of the null. But no absolute security can be guaranteed. Indeed, there are exceptions to this iniversal efficacy. Heins found cholera bacifi in sterilized milk after four weeks, typhoid after four months, and according to Dr. Lydia Rahimowitsch (Deutsche med Weck, 1909, p. 490), experiments made in the Institute for Infectious Diseases in Berlin appear to prove that occasionally tuberele burilli are not killed by less than 100° C. Organisms surrounded by fat stem to require more than the average heat to be destroyed; in accordance with the findings of Ignard, which appear to prove that unsterdized butter would preserve cholers and tubercle bacilli much longer than unsterilized milk. H that be beyond doubt, butter and rich wills would retain their infecting qualities longer than average milk with a moderate percentege of for. So there may be a danger in fat milk which does not exist in milk that contains less fat.

Whatever I have here brought forward is certainly not to disparage the holling of the milk; it is meant to prove the danger of relying on a single preventive when the causes of intestinal disorders are so many. It is true, however, that the large majority of the latter depend on causes which may be met by sterilization, but not by sterilication only; also by pasteurization,—that is, heating the milk to 70° C. = 158° F., and keeping it at that temperature for thirty minutes, —a procedure which destroys the same germs that are killed by a more elevated temperature without much change in the flavor and taste of the milk.

One of the questions connected with the employment of sterilized or pasteurized milk is this: whether the milk to be used for a child ought to be prepared at home, or whether the supply may be procured from an establishment where large quantities of milk believed to become immutable for an indefinite period by sterilization are kept for sale. In regard to this problem, Fligge plaintively expresses his regrets that "we have allowed ourselves to be guided by people who are neither hygienists nor physicians, but chemists, farmers, or apotheraries, and whose actions have been based on three false beliefs. Of these the first is that boiling for three-quarters of an boar destroysgernis, the second that whatever bacteria remain undestroyed are innocuous, and the third that proliferating barteria can always be recognized by symptoms of decomposition." Nothing is more erroneous. Soxiliet himself, the German originator of sterilization, knew at an early period that the fermenting process is now and then but partially interrupted by boiling, that hutyric acid may be found in place of factic acid, that a strong evolution of gas may be caused after such boiling, and that such milk may give rise to flatulency. Aye. wilk which happens to contain the resistant spores of becteria becomes a better breeding-ground for them by the very elimination of factic acid, and the longer such sterilized milk is preserved and offered for sale the worse is its condition. It may be true that these conditions are not met with very frequently, but an occasional single thath in a family caused by poisonous milk will be more than enough Therefore, the daily home sterilization is by far preferable to the risky gureliuse from wholesale manufacturers who cannot guarantee because in the nature of things they cannot know the condition of their wares.

Another alteration of a less dangerous character, but far from being desirable, is the separation of cream from sterifized milk which is preserved for sale. Renk (Arch, f. Hyg., vol. xvii.) found that it took place to a slight extent during the first weeks, but later to such a degree that 43.5 per cent, of all the cream contained in the milk was eliminated.

According to A. Weber (Arh. uns d. knizeri. Germulkeitsamt, vol. avii., 1900, p. 108), the present wholesale procedures of sterilizing milk cannot furnish milk that is absolutely free from germs. The

nearer the milk he investigated approached absolute sterilization the more readily could the gross chemical and physical changes occasioned

by sterilizing be noticed.

He found Flügge's "poisonous peptonizing bucteria" three fitness in one hundred and fifty specimens of commercial sterilized milk. They were "hay bacille," which cause a strong decomposition of albumin and copious development of hydrogen sulphide. It is particularly this rapid patrefaction which proves dangerous to the nursling.

While in sterilized milk the anaërobic microbes are neither numerous nor important, according to the same author, the aërobic kinds are able to peptonize mile in from one to two days (some species in from five to seven), and to cause patrefaction and produce hydrogen sulphide. Haw milk is indeed protected by its milk-sugar, which by being transformed into lattic acid destroys the effect of peptonizing bacteria; in sterilized milk the latter are apt to predominate.

Consequently, domestic daily sterilization (or pasteurization) is to be preferred to wholesale production, unless this be daily. That is why even Henri de Rothschild's advice is not unobjectionable. He attributes all the failures of sterilization to its erroneous methods only; he advises not to use the wholesale product when it is more than from eight to ten days old, and only in flasks of from fifty to one hundred and fifty cubic omtimetres. He also prefers daily home sterilization of forty-five minutes each. Even in this, as we shall see, there are mistakes.

The taste of milk begins to change at 75° C. (Duclaux), the milk albumin is altered at about from 65° to 70°, according to some at 60° C. Dairymen ascertained that fact from their experience in cheesemaking. Jemma found that pepsin and hydrochloric acid digest milk sterilized at 100° C. more slowly than raw milk. During sterilization lime salts are thrown out, phosphorus combinations are disintegrated, nitrogenous substances are liable to be decomposed into tyrosin, peptotoxin, and ammonium, lecithin is destroyed, lat changed both chemically and physically. During a long-continued sterilization casein and nucleon are likely to undergo marked changes, and the sugar has been found at the bottom as a brown deposit. That is mainly so when excessively high temperatures are employed, -- for instance, 100° C. by wholesale sterilizers ("surchauffage"), which cause the production of peptone by the action of chlorine on casem, or from 100" to 104" C. in steam best. But even these high temperatures do not accomplish actual and complete sterilization in all cases. Chemical toxins are not changed by them or even by greater heat, and scores are very obstinate, such as those of bacterium subtile and tyrothrix, which resist the usual methods.

But, after all, the destruction of microbes by heat is such a progress over all previous methods of employing milk, provided it cannot be obtained fresh and fairly sterile, that its disadvantages are too apt to be overlooked. In some cases heat is insufficient in its effects, obstinate bacteria not being destroyed; in other instances its excessive effect proves dangerous by destroying milk elements. While appreciating the latter danger, which is due to prolonged beating mostly, we should never forget, however, that the advantages of heating derived from the destruction of microbes, which are either directly pathogenous or indirectly so by increasing the virulence of saprophytes, are incalculable. But with every degree beyond pasteurization the disintegration of the milk becomes more marked; therefore it appears that no greater heat than from 65° to 68° C, should be employed, though it may be found wiser to extend the process over a longer time.

The lower the degree of heat which may be expected to destroy factic or pathogenous microbes the more easily the integrity of milk is preserved. Now, Theobald Smith (Inar exper Med., 1899, vol. iv., No. 2) found that in distilled water, in physiological solution of sodium chloride, in beef-broth, or in milk, when heated to 60° C, (140° F.), tubercle bacilli die mostly in from fire to ten, all of them in from fifteen to twenty minutes. The membrane, however, which is formed on milk even at 60° C, keeps tubercle bacilli alive even after sixty minutes; that is why its formation should be presented by stirring, or it should be removed.

This low temperature preserves also the taste of milk and is at the border line only of the temperature that congulates lactallumin. The confirmation of these observations made by one of the most reliable experimenters will not be wanting; then nothing will be required except a cheap and handy apparatus to present milk from getting warmed beyond for C., thus preserving its freshness and reducing or removing its dangers.

Sterilization has been claimed to be no minimed boon because of its changing the chemical constitution of milk. Still, opinions on that subject vary to a great extent, the occurrence of changes being both asserted and denied by apparently competent judges. But what I have said a hundred times is still true and borne out by facts,—viz., that no marter how beneficial boiling, or sterilization, or pasteurization may be, it cannot transform con a milk into woman's milk, and that it is a mistake to believe that the former, by mere sterilization, is a full substitute for the latter. It is true that when we cannot have woman's milk we cannot do without cow's milk. There is no alleged substitute that can be had with optal facility or in sufficient quantity. But, after all, it is not unusuan's milk. Babies may not succumb by using it, and may but seldom appear to suffer from it; indeed, they will mostly appear to thrive on it; but it is a makeshift and requires modifications.

Ergo, cow's milk is not woman's milk. It is not identical with in. Sterilization does not change its character; it merely obviates such dangers as result from the presence of most pathogenic germs and from premature acidalation. The substitution of cow's milk or of sterilizat cow's milk for woman's milk as the exclusive tolant food is a mistake. Experience teaches that digestive disorders, such as constitution or diarrhora, and constitutional derangements, such as frachitis, are frequently produced by its persistent use, and it appears to be more than an occasional (at least co-operative) cause of source.

Since the advisability of finely dividing and suspending the casess of cow's milk and of adding to the nutritionsness of the latter caused one always to teach the admixture of cereals to it, even in the very first days of infancy, the subject of infant feeding has never been lost sight of by medical men, scientists, and tradesmen. No subject has been treated more extensively, more cagerly, sometimes even more spitefully, than that of infant feeding. The philosopher's stone has not been so auxiously sought for nor so often found in medical ionmals, books, and societies as the correct infant food and the appropriate treatment of cow's milk. After the finally faultless thing had been discovered very many times, it was not a surprise but a source of gratification to me to meet, in the Berl, Min. Work, No. 10, 1805. an article of Heubner, who, after having contributed for years as much as any writer (if not more) to the literature of the sebject, reconnecteds the "utilization of flour in the intestines of young omolings," Basing his remarks, first, on the researches of Schiffer, Kotowin, and Zwrifel (quoted in my early writings on that topic thirty years ago), who, by experimentally proving the digestibility of a certain amount of starch in the saliva (and pancreatic juice) of young infants," justified my empirical findings of many previous

[&]quot;While it took Herbore more than rwesty years to remember very acceptable physiological experience, a celebrity of equal rank (Philip Biodert, Handback der Kinderkrimkheisen, rith ed., afoa p. 30) still appears to approve at the opinion that a remaining most have "no amplaces," became of their indi-

years, and, secondly, on what he is pleased to call " lacobi's practical experience," the Berlin physician recommends in intestinal diseases of the very young the simplest flours, mainly of race and outs (which have a finer microsconical itructure than wheat). He pointedly ailds, "Very young infants do better on a dilution of mile with a thin rice deciction than with more milk-sugar solution. Practical experience overrides theoretical conclusions." * There is but one point in which the famous teacher does not yet agree with me, for in his expositions we meet with the remark that he "cannot approve of the colossal dilution recommended by the authority of Jacobi." The "colossal dilution" alluded to is that of milk in four or five parts of outnessor barley-water for the use of the newly-born. In regard to this dilution also I trust I shall yet see my illustrious colleague sidingwith me. The demands of pepsin digestion and of rapid growth and the necessity of restitution of losses experienced by elimination and exerctions are just so many reasons for extra allowances of water in the diet of very young infants, who have to rely on the services of others. Older children know how to find it and how to serve themselves. In addition, it is certainly true that a large amount of water massing through the kidness removes the inconveniences and dangers of the peculiar physiological process which takes place during the first three weeks of every life,-viz., uric acid infarction,-the results of which are gravel, renal calculus (by no means rare), and pephritis, which is frequent. Indeed, since the rather frequent adoption of my plan of supplying the very young with quantities of water. I hear less of renal complaints in them than I did dozens of years ago.

Perhaps the tide is already beginning to turn in my direction. Norbert Americals, whose researches on the difficulty of destroying the hay bacillus and the bacillus butyricus are very meritorious, recommends larger percentages of water in infant feeding than the customary ones. His mixtures for the first and second months of life are three parts of water and one of milk; for the third and fourth, two and one; for the fifth and sixth, one and one; for the seventh and eighth, one and two. His figures are, therefore, not exactly like mine, but even they may appear beretic to my critic. In connection with this subject I am also pleased to state that Amerbach agrees with me on another subject. The sugar he adds to the milk food

gestibility, before the protrusion of teeth. Still, he advises cereals for the dilution of his cream matter. Before long it will be a generally accepted asserthat cereals mass be given to make teeth and timines generally when milk food above does not outlice for their development.

[&]quot; Probiren gelt über Scadiren"

of infants is not milk-sugar, but case-sugar, of which he gives twenty grammes daily, and—also according to my old teaching—more during constitution. He undoubtedly peciers cane-sugar for the reasons which guided me in my recommendations, though it is true that milksugar is being partly stripped of its dangers in the same degree as builing, sterilization, or postentization is carefully practised.

Virtually, sterilization has been practised by me these more than forty years, and has been taught by me for thirty-five years; but actual sterilization, according to Soxhlet, was introduced in New York by A. Caillé. Then manufacturing firms took it up as a matter of course. One of them was prevailed upon by me to execute a device of Dr. A. Seibert, who advised the determination of the amount of sterilized food and the graduation of the feeding-bottles according to the weight of the infant. In most cases this plan is good, for the condition of the child can mostly be measured by the increase of its weight. Only fat, clumsy, rhachitical children are exceptions, in them the rapid increase of weight is a morbid condition rather than a symptom of healthy development. Besides, he improved his food by adding, in conformity with my practice, and sterilizing at the same time with the milk, either barley- or outmeal-water. A recommendation of his sterilizer is its cheapness, which makes it more accessible to the poor. Before being sterifized (pasteurized) milk ought to be filtered. Most cooks employ napkins for that purpose. Dr. Seibert recommends absorbent cotton.

Both sterilization and pasteurization have conquered a fair standing in the popular mind. Unless, however, there be a rational time limit, the practice may become dangerous; the decomposition of the milk by oversterilization I have discussed before; scurvy and other ailments may be its results. In New York the writings and practical instruction of Dr. Rouland Godfrey Freeman have been of great advantage, particularly to its poor population. He insists upon pasteurization as a sufficient method of safety. The apparatus devised by him is thoroughly appropriate. As the adviser of Mr. Nathan Strauss in his successful endeavors to supply thousands with a safe article of food, he has benefited the city and aided in setting an example which should and will be imitated.

Pasteurization is also employed by Rotch. In a paper read before the American Pediatric Society at Boston, May 4, 1892, he presented

⁺The Value of Milk Laboratories for the Advancement of our Keroel edge of Artificial Feeding, by T. M. Rotels, Archites of Pediatries, February 1863. Also Pediatries. The Hygiese and Medical Treatment of Children, Philadelphia, 1896, ed. ed., 1901.

for the first time, among others, the following statements, which I gladly repeat, as I know his teachings to have done a great deal of good. Indeed, I was so much impressed by them that I encouraged the gentleman who had conducted a milk-laboratory on Dr. Rotch's plan in Boston to establish a similar institution in New York.

According to Dr. Rotch, "What the profession needs is the knowledge that they may have milk-laboratories where the materials are clean, sterile, and exact in their percentages. Slight changes in the three elements of milk of which we have the most accurate knowledge—namely, fat, sugar, and albuminoids—are of real practical value in namiging the digestion and nutrition of the infant (normal percentage of fat, from 2.02 to 4.37; of milk-sugar, from 5.70 to 7.10; of albuminoids, from 2.08 to 3.07; of mineral matter, from 0.12 to 0.20). The digestive capabilities of infants differ just as do those of adults, and nature therefore provides a variety of good breast-milks adapted to the individual idiosyncrasy of the special infant. With this fact impressed upon us, we can well see that in artificial feeding no routine mixture will in all cases prove successful."

All this proves also that nature allows a great deal of latitude, for the mile of a woman is changing, sometimes quite rapidly, and still the baby continues to thrive. It also proves that an attempt at regulating the percentages of milk according to invariable rules, while circumstances of surroundings and individual health—perceptibly changed or not—may differ, is liable to be very deceptive. Altogether, no iron-clad rule holds good for a living body in which organic assimilation is not regulated by the fixed laws of crystallization. This is, indeed, proved by nothing better than by the variability of the constituents of good milk. According to the very figures presented by De. Rotch himself, fat may vary from 2.2 to 4.37, albumineids from 1.08 to 3.27, and still the milks exhibiting these wide differences are normal."

In regard to the percentages of fat in cow's and in woman's milk, the results of chemical analysis have lately changed in favor of the latter. But the general principles in regard to fat feeding—its effect on digestion, and the normal occurrence of fat in the healthy faces of an infant fed on normal nourishment (breast-milk)—are not thereby altered.

Neither mathematics nor chemistry alone directs the organic economy. If that were so, the chemist Soxhlet, otherwise so deserving and justly famous, would be justified in the advice he coolly given the physician to add mile-sugar when there is no fat in the food, and thereby to obtain the necessary amount of carbollydrates. Fortunately, organic chemistry is not identical with physiology.

Dr. Rotch continues, "We are in need of a means by which we can prescribe exactly according to the idiosyncrasy of the digestion we are dealing with.

"A separator with many thomands of revolutions in a minute separates from the milk foreign material and divides it up into a cream of a stable percentage and separated milk. The milk-sugar and the albuminoids, also the mineral matter of this milk, are fairly well known, and thus the laboratory worker is enabled to put up any prescription, which, for a healthy haby of four months, would read: fat, 4 parts; milk-sugar, 7 parts; albuminoids, 1 50 parts. Put up eight tubes, each four ounces, with lime-mater ten per cent. Pastentian (75° C. = 167° F.) for twenty minutes. In this mixture the lime-water is just sufficient to slightly alkalize the coul's milk." In this way the food of the child can be modified according to age and to changed conditions of health."

In a case of shodenal jaundice in a girl of six years, the sloctor prescribed fat, 0.5 part; milk-sugar, 6 parts; albuminoids, 4 parts. Give four owners every two hours. Send twelve tubes, each four somes, line-water ten per cont. In a case of summer diarrhous in a

[&]quot;Cow's wilk is refer alkaline or neutral or acid. The constant recommentation of ten per cent of line-water for the purpose of alkalination is, therefore has from exact and strictly scientific. Besides, bore much alkalination is effected by three diagrams of line-water." They contain exactly or are pressured to contain, one-quarter of a gram of line.

Line-water (liquor calcis) as a same ted agreem solution of calcium hydrate whose percentage varies with its temperature. At 95° F, it contains somewhat over 0.17 per cent, in rising temperature less, at the boding point one part of lime in thirteen hundred of water. It refinishes as the liquid cools. If the food outraining line-water be given at a temperature of 80° er 90° F, part of the line is thrown out. Emerwater surmed loans most of its affailing reaction; it is markedly affailine when cold, only faintly so when botled. An experiment made with good will from the beniefedd singly give the following modes. Reaction acid, sho on boding. Our twentieth part of lime-water added to it changed the reaction but alightly; it remained acid. The mixture being boded, reaction remained the same. When again ecoled and thalom up it was still and but slightly less so than before the dilution of the milk with line-water.

The addition of notions because to milk which is to be kept from souring a procedure which is (besides lime-water) recommended by De Holt also, may become a grave mistake. The very bondle which, with their spaces, result beiling to an amount degree, three best in a milk that is made thoroughly alkaline.

girl of four months, lat, 2 parts; milk-sugar, 5 parts; alluminoids, 1 part. Send twenty tubes, each one ounce and one drachin. At time of each feeding add lime-water, three drachins. Sterilize at 212° F.

One of the beliefs guiding the author of this method is as follows:

"The constituents of the nutriment which nature has provided for
the offspring of all mimals and human beings that suchle their young
are essentially animal, and not vegetable. Human beings in the first
twelve number of life are carrivora. An animal food entirely and
always free from any vegetable constituents has been proved to be
the matriment on which the greatest number of human beings live and
the least number die."

Those who have followed no teachings at any time thring the last third of a century know that I take some exception to this broad statement. Saliva and pancreatic juice are good for something better than idle elimination, and "nature" prepared the animal young from the first moment for more than more pepsin digestion. The persof Dr. Rotch refers to is his experience only. Mine has taught me somewhat differently from the axiomatic positiveness of his assertion. But be it far from me not to present Dr. Rosch's case in full. His standing and merits are such as to give him a hearing wherever and whatever he discusses. His rules, which, moreover, may be modified by my method at any time, are thoroughly good; they are scientific, exact, and well thought out. Moreover, they have been proved to be practicable. No natter whether it is the careful handling of a cantionsly prepared milk, the methodical composition according to percentages, or the faithful pasteurination, or all of them, the results are good. I know of a number of halics who in health and disease have done well on the protracted use of the laboratory milk. Only one observation struck me in many cases. The formation of the muscles, and particularly of the bones, appeared to be slow; the teeth came a number of weeks or even months too late; the cranial bones turned slightly soft in not a few instances. In many such cases I lead to add animal broths or juice before the usual time; in two. when I tried phosphorus (elixir phosphori), it was rejected; in all others it was well borne and useful. But, taken all in all, the method appears to be sound and successful, so far as it can be with cow's milk and the casein of cow's milk. It is to be deplored that for the present it is a method only accessible to the rich; it required a special benevolent fund to supply one hundred and twenty-five Boston poor children with the same food; mine has the advantage of being one for the people, both rich and poor. If, or as long as, the circulars of the liboratory keep free of pretentions exaggorations,-there was

a time when they took that turn,—the profession will do well to rely on it, or its like, as one of the means of furnishing the hally a food deprived of dangers and in most cases sufficient. When it is found insufficient as regards tissue-building, cereals may always be furnished in the same mixture. The empirical knowledge of their beneficial effects with which we have been furnished for more than a generation has lately again been tested experimentally by Springer, of Paris, who improves the development of bone by a decoction of mixed cereals beiled for hours in succession. This bong duration of the boiling process is, however, not demanded.

Rotch's "modified milk" feeding has become frequent in our large cities,-Boston originally, New York, Philadelphia, Chicago. It is expected that a habe has a prescription given by the doctor, and that the daily portions are prepared in and sent from the laboratory. But the most frequent procedure is at present this; that people will apply at the laboratory and the harmoid in charge will prescribe according to the printed schedules of proportions which are said to correspond with certain ages,-a very unscientific application of a method which was meant to be the very essence of scientific occuracy adapted to the individual case. One reason why Dr. Rotch insists upon the laborators furnishing the separate meals is that he does not trust mothers in regard to accuracy and to cleanliness (Festschrift in bonor of Dr. Jacobi, New York, 1900, p. 318). I must admit I am of a different onimon. I know of flies and other foreign substances in the "modified milk" bottles sent from some "laboratory." That they were also sterilized does not help the ease; indeed, the larger the number of strangers and paid employees who are to do your work the greater is the possibility of mistakes.

The method is rather expensive and always must be. The annual income of many a workingman would have to be spent on the baby's feeding. The objections raised to this and the urgent necessity of finding substitutes for the population at large, rich and poor alike, made Rotch say (Boston Med. and Sarg. Journal, September, 1895, p. 293) that "the advance in infant feeding was very much impeded by the cry in New York a few years ago for cheap-food for the poor."

There can be no doubt that the end aimed at by Dr. Rotch is partly obtained by securing a reliable and approximately fresh milk and by sterilizing it in small portions. In that he has performed, with Cost and others, most valuable educational and missionary work. That, however, the six thousand eight hundred revolutions a minute should leave the milk intact, that after the mixture of its "disjecta membra" we should again have milk, is not very probable. Lamin (Dis Dorpat, 1880) fed mice on milk and they lived, but they died when the constituent parts of milk, after having been severed, were recompounded. I know, however, of no experience of the same nature.

The "fat milk" ("Fettmilch") of Gartner is also obtained by centrifuging and sterilining. According to Escherich's analysis of woman's and of cow's milk, this preparation is to contain cases 1.76, fat 3, and sugar 2.4 per cent. It is preserved in tin cases, which are favorable to occasional decomposition. Bud odor, discoloration, and fat swimming on top are frequent occurrences. It is expected to be given indefinitely, and no consideration is paid to the fact that woman's wilk (not to speak of colostrum) contains more albumin and salts and less fat in the first few months, but less albumin and salts and more fat later.

Biedert prepares a cream mixture which contains one per cent, of casein, two of fat, and four of sugar. It is to be mixed with milk in different proportions. One of the reasons urged by him for the addition of cream is the necessity of greater dilution (accomplished by my cereal decections) of the con casein, the difficult digestion of which he takes for granted.

In his "Kinderermillrung," 2d ed., pp. 152, 170, he recommends to feed a buby during the first few months as follows: every kilogramme (two pounds) of the buby's weight is furnished two himdred grammes (six and a half ounces) of food which contains fifty of milk, one hundred of oatmeal-water, and eight of sugar. Heubser ("Sänglingsernährung und Sänglingssphäler," (807, p. 13) mixesone part of milk with one of a flour decection (one teaspoonful toone-half pint) which contains 12.3 per cent, of milk-sugar. Of this mixture he gives six hundred grammes daily up to the fourth week, seven hundred and fifty to the seventh, and nine hundred after the eighth, in from eight to six meals.

The mixture of Dr. Meigs is well thought of by many physicians. In his own words, "There must be obtained a quart of good fresh milk, not too rich and not poor; average milk is hest; this is placed in a high pitcher or other result and is allowed to stand in a cool place for three hours. The upper half or pint is then poured off, care being taken not to shake the vessel, and this upper pint of weak cream is to be kept for the use of the infant.

"There must also be made a solution of mile-segur of the proportion of eighteen drachms to the pint of water. It ought to be kept in a fairly cool place; if it be sour it must not be used

"Three tablespoonfuls of each, the weak cream and the sugar-

water, are then mixed with two tablespoonfuls of lime-water. They are then warmed for use in the feeding-bottle.

"In the great majority of instances where it has been fairly tried, this food has proved very successful" (Arthur V. Meigs, "Feeding in

Farly Infancy," 1896, p. 7).

This food of Meigs seems to be too easily influenced by irregularities and by accidents happening to what he calls cream during its formation, and to the milk-sugar solution, to be proof against frequent mistakes. Fortunately, however, digestion and assimilation are not regulated by mathematics.

Dr. N. B. Cott, who believes that cow's milk when properly prepared furnishes the sufficient diet of an infant and supplies all its needs for robust health, gives the following rules for modified milk for infant feeding, reade with one quart of bottled cow's milk: "First six months, the top milk, cream one-half pint, boiled water one pint, milk-sugar seven hundred grains; from six to nine months, the top milk, cream one pint, boiled water one pint, milk-sugar nine lumdred grains; from nine months to one year, the top milk, cream one and one-half pints, boiled water one-half pint, white sugar three teaspoonfuls."

From the very first month of his a distinct diastatic effect is prodisced by the seal secretion; it increases with every month. Even infusions of the purotids, prepared at different times after death, produce the same effect. Infusions, however, of the pancreas taken from the bodies of infants who have lived three weeks produce no such changes. The diastatic power of the pancreas begins with the fourth week only, and remains fireble up to the end of the first year. Krüger (1891) found in the fortus of seven months a sugar-forming ferment which increases towards the normal end of intra-uterine life, is still small in quantity at birth, but grows so rapidly that it is as active about the eleventh month of life as it is in the adult.

Zweifel experimented with infusions of different glands. That of the submaxillary glands of an infant did not transform starch into sugar, even after the lapse of a whole hour. The effect of an infusion of the parotid of a baby seven days old was distinct after four minutes: however, that of the parotid of a baby which had died at the age of eighteen days, of gastro-enteritis, did not act until the lapse of three-quarters of an hour. Nor was a diastatic result obtained by a similar infusion made of the parotids of a baby prematurely born, and one who died of diarrhous and debility.

It is a remarkable fact that different varieties of starch are not changed by saliva into grape-sugar in the same length of time. In reference to the time required, however, there is no uniformity of opinion. Solera found that the transformation of the starch of the potato was the most rapid. Next came that of Indian corn, next wheat, and the transformation of the starch of rice was the slowest. According to Malay, raw starch changes slowly, holled starch quickly in his experiments, that of the potato required from two to four hours; that of wheat from one-half to one hour; of barley from ten to fifteen minutes; of outs from five to seven minutes; of rye from three to six minutes."

It is important to know that the effect produced by saliva persists in the stomach for a period of from one-half to two hours. But it ceases altogether, and starch will no longer be changed into grapetogar, inside the stomach, as soon as the secretion of hydrochloric acid has begun in the digestive process. This is a very important fact, because it shows that the farinaceous food of the infant or child, though it be not musticated, and pass the mouth very rapidly, is in the stomach still under the influence of the saliva.

Hydrochloric acid is not sceneted at once. The first acids in the stomach while digestion is going on are organic, mostly lactic. This is found to be contained in that organ when gastric price is removed from it in the first period of digestion. Thus in a gastrostomized boy Uffelmann found under normal circumstances, and in the absence of fever, during the first half-hour, lactic acid only; afterwards hydroehloric acid. The latter is not met with during fevers of any kind.

[&]quot;When salves is found insufficient at any age, medicinal aith are welcome. Taka-diastase has been recommended for the purpose of digesting stanch. Priederwald (N. V. Med Journal, May 20, (807) is very enthmisatio in its praise. "It is employed in hyperactifity. It converts one hundred times its weight of stanch in ten minutes, and thereby replaces salva. It continues its action in the stormach, stimulates gastric secretion, and promotes the motor function of the stormach, and thereby the digestion of the proteids."

This agrees with what Ewald and Boas published as the result of their experiments. But they claim to have found hydrochloric acid only when a decornor of starch alone was introduced into the stomach. Still later Th. Rosenbeim (Centralb) i. d. med. Wiss., November 12, 1889) reports as follows, after the ingestion of fully grantness of burst and one hundred and fully of water. Fees hydrochloric unid miles its appearance in the healthy sounds very sailly: n.j per mille after fifteen minutes, no per mille after thirty minutes. This quantity or more is found until the climination of chyme has been completed. From beginning to end there is facts and to a uniform amount, via 0.3 per mille. In carcinoma there was but on per mille of hydrochloric and, in hyperactifity in per mille. In every case and in every period of digestion there was but on per mille of hydrochloric and.

provided the temperature is high, nor during a severe gastric catarrh (and also in dilatation of the stomach resulting from congenital or other constriction of the pylorus). In these conditions farinacea (amylacea) are taken to advantage, principally because the diastatic effect of saliva is not disturbed.

Some of the main points to be remembered from the foregoing are these:

There is diminution or absence of saliva from the purotid in the very young while suffering from diarrhess and debility. It is never copious. Thus the very young when well ought to have but little starely food, and when sick still less, particularly as the puncreas cannot be relied on for diastatic action in the first weeks.

Whatever sullva, however, has been secreted and is swallowed, continues its action in the stomach as long as there is no hydrochloric acid in it. This in the healthy is secreted only after half an hour or later: in the feverish and catarrhal stomach very much later or not at all. Thus what saliva is present displays its diastatic action continually. Therefore the food craved for and digested by children, also by infants to a great extent, is, besides milk, tarinaceous. Animal food which requires hydrochloric acid is not wanted until later, nor is it readily digested in the stomach of the very young.

In anamia, convalescence, particularly in fevers, the functions of the storageh are impaired. In them both pepsin and hydrochloric acid are not secreted at all, or in very small amounts. In these cases fair quantities of water are required to start the secretion.

Practitioners and authors who had convinced themselves of the ill success often attending the use of milk, or watered milk, commenced at an early period to mix it with anar-somes, near-tea, or egg. Bretonneau reported, as early as 1818, that "takes mesenterica" disappeared, in the hospital of Tours, from among the children fed on beef-soup and milk. This mixture Vanquelin declared, among all preparations, to come nearest to mother's milk. The administration of some beef-soup, well made, a cupful every day (mutton-booth when there is a tendency to diarrhosa), is advisable before the end of the first year. Long before this period, indeed at any time during infancy, it is indicated in cases of early rhachitis, though there be but few

per mille ofter an hour) and a faw amount of lactic acid when rarbelry-frates only seers taken, no matter whether salies was admitted to or excluded from the stomach.

These data are here added for the purpose of showing that the difficulties of attiving at absolute facts are exceedingly great. Still, the results of the three observers do not differ too much from the accepted document.

symptoms such as rhachitical constipation, undue adiposity, or retarded teething.

Beef-tex, well made, in a bottle swimming in the water-bath, is stall believed by some to be the model food. That it is not so rich in soluble alluminoids as was believed ought to be generally understood by this time. What, however, it does contain in large quantities is salts. Thus it is a dangerous article in summer diarrhou, and must never be administered by itself. When given at all, it ought to be in combination with farinacea or raw egg albumin (which in this mixture requires very little salt, if any).

So far as albuminoids are concerned, heef-broth is about as nutritions as whey, and no more. But on account of the extractive substances of beef, kreatin, and kreatinin, it is more stimulating. The temperature of the body is not raised by it. In gastric irritation, gastritis, and acute dysentery it ought not to be given. Veal-brothis liable to increase diarrises, mutton-broth constipation, and the latter is therefore preferable in cases of diarrhox. A broth of beef. which contains from 1.5 to two per cent, of albumin, is made by mixing one part of beef and six of water with a little sodium chloride and allowing it to stand from ten to twelve hours. Then it is slowly boiled and the whole mass pressed out. Still better is a modification of Liebeg's beef-tea, which is obtained by adding one half-pint of water, with six or seven drops of dilute muriatic acid. to a quarter or one half pound of finely cut lean beef, stirring it occasionally during two bours, and boiling a few minutes. Beef-juice obtained by pressing out beef after slightly broiling it contains from six to seven per cent, of albumin. It is only slightly acid, and spotls anickly.

The peptonized beef preparations are available both internally and for rectal alimentation. They may be mixed with hot water or bot broth; a few teaspoonfuls and upward are valuable additions to the daily food. Those who object to some of them because of their strong aromatic taste and color will still relish them when quite cold. Still, the administration of peptones should be controlled by a careful consideration of the condition of the digestive organs. The last product of gastrie digestion is albimose; the formation of peptone is not completed until the diastatic action of the pancreas, and perhaps also of some intestinal hacteria, has reached the thyme. It was taken for granted that neither albimose nor peptone could be formed without the presence of hydrochloric acid. In part this is a mistake, for dogs deprived of their stomachs, and men with no such secretion, are known to prepare them. Still, peptones have been given for the

purpose of supplying what the storach could not, or was supposed not to be able to, furnish. They have a bitter taste, are not always well forme, even in the rectum, and may cause vomiting or purging. A teaspoonful of most of the persone preparations holds from three to four grammes (two to three scraples) of albumin, which is a fair addition to the nutriment of a patient whose condition requires much, and very digestable, food. Still, sight should not be lost of the condition of the digestive mucous membrane. In conditions of sever, congestion, gatarrib, etc., absorption is very slow; much peptone is not absorbed, dyspeptones are formed, and a severe form of autoinfection may be the result.

Scraped beef, raw, has been highly recommended in the chronic stage of, and convalescence from, exhausting gastro-enteric catarrh these forty years. It is very digestible and, but for the danger of causing terms mediocanellats, a valuable addition to our means of restoring health. White means contain less fat, hemoglobin, and extractive material than beef. Sweetbread (thymns), 22 per cent, albumin, 6 gelatin, but 0.4 fat, 4.0 sults, and 70 water.

Meat thoroughly dried in the water-bath and finely powdered, also hard egg albumin in the same condition, are easily taken in milk; they are excellent additions to a patient's diet at a somewhat advanced ago (at and after three or four years).

For has been utilized as an admixture to milk, or as its substitrate, in a great many ways. Both the yolk and the albumin have been so employed. The white of an egg, with a little salt and six ounces of water or harley-water, well beaten and shaken, is a good mixture, which can take the place of infant food only temporarily, but is an invaluable makeshift in severe intestinal catarrh, or a permanent nutriment in the same, when added to other food.

Fulkland skins milk and transforms it by means of pepsin. The process does not recommend itself to general use on account of its circumstantiality. Roberts heats milk to nearly the building point, and treats it with liquor panerealis and sodium bicarbonate. Fair-child's method of poptonising milk is generally understood all over the country and is widely appreciated. J. Rudisch's method of improving cow's milk for the use of children and adults, sick and well, particularly those who suffer from gastric catarrh and do not digest milk in its usual composition, consists in mixing twenty-five minims (half a teaspoonful) of dilute hydrochioric acid with a pint of water. Then a quart of milk is added. When this mixture is holled but a few moments it keeps well and is quite palatable and highly digestable. It does not congulate unless there he too much acidity in it.

Someone is one of the artificial preparations which deserves some credit, first, because of the absence of such nucleus as tritiate the kidneys; second, because it is a germine albumose, a teaspoonful of which is claimed to contain as much albumose as is held in half an egg or three tablespoonfuls of milk. Thus, a number of teaspoonfuls well diluted in water or in broth, or now and then in milk, may be given daily in cases of aniemia, or slow convalescence, or in sickness. To recommend it, however, as a regular food is "trade;" to add it to cow's milk so as to make it "resemble human milk" (Rieth) is sheer nonsense.

G. Klemmerer, who discussed the artificial nurriments of the trade (Berliner blin, Work, 1897. No. 26), look exception to every one because of their nucleosness in "almost" every case. He correctly stated that the products of the trade are expensive, are mostly inferior to their promises and claims, and under ordinary circumstances should not be substituted for the direct products of nature. That is exactly the position I have always taken in regard to artificial foods; but the practitioner, who deals both with commonplace and with exceptional cases, is glad now and then to fall back on some preparation which, while not requiring all of the normal process of digestion, may save life in a given case. There is no food which suits every storach or every case in the well or in the sick, and the greater the facility of a wholesome change the better. That is why, now and then, the artificial barinaceous foods, in which amylum is more or less transformed into dextrin, are filling a gap in the rare cases in which milk; though ever so well prepared, or the cereals, like outment or barley, are not tolerated. Of the artificial foods extract of malt, which, with its albuminoids, fifty-three per cent. of sugar, and fifteen of dextrin. is so putritions that a tablespoonful is the equivalent of an egg, may be very serviceable. The percentage of sugar it contains is very nutritious; in the same way the effect of sugar (cane- and even milk-), also of honey, ought to be utilized oftener than seems to be usual. The carbolivdrates, generally, are the main food for the feeble and the feverish. Even the well will get along, but for a time only, with less albumin than was claimed by Liebig and by Voit. provided they are supplied with non-nitrogenous food. Under these conditions Hirschfeld limits the quantity of allemin demanded by an adult to thirty or forty grammes (one or one and a half otinoss).

Account, has conquered its place among the medicinal toods in the diseases of infancy and childhood. Very little, if any, is required in catarrhal, or the first stages of inflammatory, diseases. It is contraindicated in the usual forms of meningitis, acute cardiac ailments, acute gastro-enteritis, peritonitis, and dysentery. It finds its application in depressed strength and vitality and in collapse: thus, in the rules for the management of infants during the hottest (the very bot only) days of summer, distributed during several decades by the Health Department of the city of New York, I recommended the administration of a teaspoonful of whiskey daily. Nobody appeared to find fault with me except some pulpits. It is also required in thronic diseases and slow convalescence.

Its action is stimulant, nutritive, antipyretic, and antiseptic. It is decomposed into carbonic acid and water, and thus may save the waste of material parts of the body. When its odor is perceptible in the breath of the patient, it ought to be stopped or diminished. That is very liable to occur, for instance, in pneumonia, in the first stage of which alcohol is but rarely indicated or tolerated. When given in sufficient quantities, it reduces the temperature; the amount required for that purpose is, according to Dine, forty grammes, corresponding to about three ounces of brandy or whiskey. Its most beneficial action is exhibited in sepsis of all forms, mainly also in the septic varieties of erysipelas, no matter whether there are brain symptoms or not, and of diphtheria. Here it is almost impossible to give too much. The doses must be watched so as to be sufficiently large. Whoever is not afraid to give, in diphtheria, six ounces of whinker daily to a child when one or two fail, or ten or twelve when six fail. will seen convince himself of its power for good. It must never be given a concentration; the gastric stucous membrane tolerates no pure brandy or whiskey for any length of time; they must be diluted with either water or milk properly prepared. Wines, brandies, and whisless are not equivalent. In our country the latter is obtained pure with greater facility and at less expense, and besides has, for many, a less disagreeable taste than either of the others, which are often adulterated. The ether contained in wine militates against any artifebrile effect which may be expected from it; the fusel oil, also the furfured (or pyromucic aldehydo), and the saliculic aldehydo, which is used in the manufacture of bitters, and the artificial bonutets. with which beambes are too frequently adulterated, act rather as noralyzing then as stimulating agents.

Alcohol is having a hard time between temperance women and sensational medical writers. We are told again and again in medical journals that when alcohol is taken in hig droes a long time with no indications, the poor-house, convulsions, quilepsy, chorea, and crime are the inevitable tensits for the imbiber and his offspring, and for these reasons it must not be used in medical practice. We are often told that large doses are required to have its antifelnile effect,-the same thing Binz tangle us three dozen years ago; also that its stimulant effect, in small doses, depends on paralysis of inhibition only,-an explanation which does not detract from its value; that its stimulant effect is indeed imaginary only, for though it undergo combustion, some assert it does not prevent the disintegration of albumin in the tissues, and others that it does not diminish but rather increases the elimination of nitrogen. It is mainly Kassowitz who appears to have a personal grievance against alcohol (as also against diolitheria antitoxin), and to make his point is not afraid to strain the truth to the muost, and beyond. When he holds up my recommendation of whiskey in diphtheria to the horror of mankind, he adds, "Still, the same author advises to give healthy nurslings during the summer daily a coffeespoonful of whiskey." This statement in a mistake, if nothing very much worse. What Kassowitz may have read is as follows: "in hot weather, but in the hottest weather only."

Cushney * sums up his opinious by saying that alcohol deserves a place in therapeuties as a narcotic, and to a less extent as a stomachic, and in certain conditions as a food. Let him add, that it fills a place as a stimulant in septic (and other) diseases which cannot be replaced by any other, and that great elimicians like Curselmann or Jürgensen use it as such, and be will be still more correct.

Describes is one of the functional disorders of the stomach, and depends sometimes upon slight changes in the gastric mucous membrane only. It consists in partial or complete loss of appetite, with more or less impaired digestion. In regard to this, however, in every individual case, it is good not to rely too implicitly upon the reports of mothers or nurses. Other children will complain of precordial heaviness. They will suffer, as do infants also, from eractations, which, when they result from swallowing air, are absolutely odor-less, but when they consist of actual gustric gases, have a very faint odor. A sensation of oppression and frontal pain is complained of by older children; the younger ones are upt to somit.

The causes of dyspepsia must be sought for either in anatomical changes in the organ (beyond the normal development of the intertical glands, in contradistinction to the lymph apparatus which lags behind), which can rarely be proved, or (more frequently) in quantitative or qualitative changes in the secretion; or in a changed neryous influence, as, for instance, in fever; or in a abnormal condition

^{*} Boston Med and Stree Jose, July 10, 1902.

of the food, which is the most frequent cause, and the presence and first effect of pathogenous microbes.

The treatment of this absorder consists chiefly in abstinence or in the use of the greatest care in the preparation of meals. Even mother's milk may have to be dispensed with and ice-water or small pieces of ice given sistead. At all events, the casein must be greatly diminished. Milk requires builing, pentonizing, or treating with muriatic acid according to the method I have detailed before. In every case the admixture of faringceous decoctions and a little salt improves the digestibility of mile, though prepared as described. In many the latter alone, with or without a meat-broth, will be the only food which is tolerated. The gastric secretion of infants who have been fed artificially is liable to be hyperacid; then alkalies should be given at once. The addition of a few grains of sodium bicarbonate (baking-powder) to the food may suffice. A few grains of an alkali (magnesia, sodium, calcium, arcording to the indications explained elsewhere), given a few minutes before every meal, act more surely. There may be the indication for bismuth, or for resorcin small doses () to 200 water), one-half to one teaspoonful every two or those hours, or for irrigation of the stomach mostly with a saline solution (6 to 1000), or for the administration of orexin tannate, which appears to increase the secretion of hydrochloric acid and the function of the nuscles of the stomach.

Voarrand has been mentioned among the symptoms which accompany dyspepsia. In the infant, however, it is almost a normal occurrence. The infantile stomach is vertical and more or less cylindrical, and the fundus but little developed. Thus, whenever there is a tendency to empty the stomach the antiperistaltic motions do not press against the fundus, but directly operard. There is, therefore, less genuine vomiting than a mere overflow of the contents, which mostly takes place so easily that the babies are not disturbed by it.

The treatment of such cases, if treatment be required at all, would consist in the application of some dietesic rules. The infant should have less food and at longer intervals; should not be carried about immediately after meals; ought not to be shaken or jobed, nor carried face downward.

This overflow takes place, as a rule, immediately after the baby has been nursed: at that time the milk is still fluid. If vomiting occur a little later, the milk will be congulated; if, then, the milk be not congulated, the stormels is not in a normal condition. In these cases, and particularly when the baby lives on artificial food, there are uneasiness and pain associated with the vomiting. An acid mucus is expelled, together with the contents of the stomach; these are the cases in which antifermentatives, such as silver nitrate, bismuth, resorcin, are indicated. Sometimes antacids alone will suffice, as detailed above.

GASTRITIS (ACUTE GOSTRIC CATARRIE) —The feeble, the attemic, the consulescent, and the fererish are predisposed to this affection, but it may occur in the praviously healthy as well. In all such children the production of normal gastric acid is diminished. Besides, in all of them the muscular power of the storage is reduced.

Cold or hot ingesta, too large quantities of food, acids, spices, irritant medicines, alcoholic drinks, fat meat, cake, decomposed food with its ferment, each may be the cause of acute gastric extarrls, and must be carefully avoided; deutition, as such, is not a cause. Exposure to changes of temperature is apt to produce gastritis, but the usual cause is improper food. A single small meal, consisting of (in that case) indigestible food, increases pain, vomiting, and fever, Abstinence and cold water to the head act well when there is a tendency to consulsions. Cold applications to the heart will also reduce the temperature of the whole body. A warm both will frequently do good; but bathing and handling the child should procood with great cantion and very gently while a convolsion is lasting. When thirst is very great, small quantities of ice-mater should be given often, or Seltzer-water, or Vichy, or Apollinaris; also water to which dilute miniatic acid has been added in the proportion of one to three or ten thousand.

Solid food must not be taken. When there is a great deal of mucus, milk should be given, if at all, very much diluted, or prepared after Rudisch's method.

When the tendency to vomit is great, food and frink must be given in teaspoonful doses, and when the sensitiveness of the stornach is very marked, mucilaginous and farinaccous foods only will answer, together with small doses of bismath repeated every one or two hours.

When acid is predominant, calcined magnesia will answer best, if given in small doses frequently repeated; also sodium bicarbonate, and very small doses of opium, one-sixtieth to one bundred and fiftieth of a grain, every hour or two hours.

CHRONIC GASTRIC CATARRIE is either the termination of an acute enterth or of the persistent continuation of injurious influences. Large and frequent meals, too cold or too hot food, and fast eating are frequent cames. That is why bottle-feeding is preferable to drinking from a cup, and why Henbuer (Festschrift) emphasizes the necessity of under rather than overfeeding children of early and of

advancing age. The stomach may be either in a hyperzenic or in an anemic condition; it may be hyperesthetic or atonic. Its secretion may be deficient or faulty. All of these changes may take place in the stomach without any complication on the part of neighboring organs, or these may be the only, or partial, causes of the gastric discerler: thus pre-eminently cardiac or pulmorary ailments, which result in impaired circulation of the distant organs. Indeed, many a chronic catarrh of the stomach, both in the young and adult, requires among its first indications a proper attention to the original cause. At all events, the number of meals and the amount of food must be adapted to the digestive powers. Medication can do good service in most cases, either such as is directed to the mucous membrane itself (alkalies, hismath), or to its faulty secretion (sensin with muriatic acid, resorcin), or to the debilitated condition of its muscular power (strychmine). At all events, the children must be taught to eat slowly. Their food must be tepid and not too much diluted, inasmuch as in musty cases absorption is slow. Sugar, fat, and starch must be allowed in small quantities only.

ULCERATIONS of the stomach (and duodenum) demand that the organs should be kept as alkaline as possible. Abnormal acids (acetic. butyrie, caprylic, or lactic in excess) must be neutralized before food is given. An occasional antacid is not sufficient to attain that end; it must be given regularly, every two or three hours, also a few minutes before a meal. Sodium and magnesium salts, which contain carbonic acid, should not be given regularly. That gas produces peristalsis. Calcined magnesia answers best in doses of one or two grains, udministered every hour, or every two or three hours, in water which must not be too cold. Hot water is even better. More than that quantity is seldom tolerated because of its purgative effect (which, however, is very welcome, to a certain extent, in patients with a tendency to constigation). When a larger quantity of antacids is required, prepared chalk or calcium phosphate may be added to the magnesium, with or without bismuth (subnitrate or) subcarbonate. In such a condition the effect of line-water is in part imaginary. If given for the purpose of neutralizing strong acids, it is a failure. That medicital treatment must be continued through weeks or months. Without it I see no gastric or duodenal ulceration getting well, in spite of the most careful electic regulations.

The very function of the diseased segan is a great danger. Both the stomach and duodenum must be kept as idle as possible and their labors made easy. No indigestible food must be given, no solid food permitted. Most cases in older children bear heiled milk (in some mixed with a little sodium bicarbonate), strained oatmeal or barley gruel, rice or arrow-root water, and stale wheat bread; a few, also, raw beef, scraped. Some tolerate nothing but boiled milk, or buttermilk. There are those who prefer koumiss, mateous, peposnized milk, or that prepared with muriatic acid. Whatever they take must be swallowed slowly. Milk, when drank hustily, is liable to coagulate in hig, hard lumps, and proves indigestible and injurious. The same milk, when taken by the mouthfuls or from a spoon, will prove beneficial. The milk should be holled in the morning and heated over again several times during the day, or it should be sterilized. It must not be cold when taken, and may be mixed with a very small quantity of table salt only. Quite often, to avoid the formation of hydrochloric acid in the stomach, salt should be withheld altogether. Many prefer and tolerate best the mixture of milk and zereal decoctions. Such must be the food for weeks and sometimes for months; the meals must be small and more numerous. Thus the patients will get well, and thus only.

ACUTE AND CHRONIC ENTREITS, INTESTINAL CATAGORI, with diarrheea as a prominent symptom, compare with acute and chronic gastritis in their mutual relation. Acute catarrh of some duration extends mostly over the whole intestine; its worst cases are also complicated with the same condition of the stomach. The most serious forms are those of "acute gastro-enteritis." In them the diet must be a very strict one. No one milk, no builed milk, no milk at all in any murture, in had cases. In the very worst cases total abitinence for from one to six hours, or much longer; afterwards, teaspoon doses of a maxilaginous or farinaceous decoction from time to time. A good preparation is the following: free ounces of barley-water, one or two drachms of brandy or whiskey, the white of one egg, salt, and cane-sugar: a teaspoonful every five or fifteen minutes. according to age or case. Later on a tablespoonful of boiled mile may be added. The same may be mixed with mutton-broth, which, with the white of egg, is better than beef-soup or beef-tea in convalescener. In vomiting, abstinence is mostly superior to ice; the latter may sometimes quiet the stomach and feel pleasant momentarily. but it stimulates peristalsis. Beef-tea, in its customary preparation, ought to be avoided. In convalescence, when given at all, it ought to be mixed with barley- or rice-water. Towards the end of the discase, or when the discharges are numerous and copious, the blood becomes inspissated, the circulation slow, and thromboses (hydrocuscephaloid) arise in the smallest yeins of distant organs. Then it becomes necessary to introduce liquid into the circulation by administering water through the mouth or, if it tolerates it, the recrime; in desperate cases the infusion of a sterile salt-water solution (6 to 1000) into the subcutaneous tissue, once or repeatedly, may save life. Never are the common sense and tact of the intelligent practitioner more thoroughly taxed. In regard to that there can be no law. No printed rule over supplies or substitutes brains.

In chronic cases boiled milk must form but a small part of the food. The white of eggs in water, or in burley- or rice-water, is superior. Still, there are exceptional cases in which even they are not solerated. Then the cereal and farinaccoun preparations, with or without mutton-broth, are preferable. In rare cases one of the better artificial foods is quite successful. Acom coffee, acom cocou, answer well when given once or twice daily. The meals must be small, and may be more numerous, but a fair regularity must be kept up.

Construction may have many causes. The intestinal numers may be deficient or too viscid. Such is the case in febrile conditions, now and then in chronic intestinal hypercenia, and also when there is too much perspiration and secretion of urine. Or the food may be inoppropriate, as when it contains a superalumdance of casein, particularly in cow's milk, or of starch, or too few salts, or of sugar.

Peristalsis may be incomplete through rhuelitic debility of the musenfur layer or the muscular weakness dependent upon sedentary habits, chronic peritonitis, intestinal atrophy, and hydrocephalus.

There is also, besides mechanical obstruction by cystic tumors, infussusceptions, volvulus, and imperforations, an apparent constipation which ought not to be mistaken for any of the above varieties.

Now and then a child will appear to be constipated, have a movement every two or three days, and at the same time the amount of
faces discharged is very small. This apparent constipation is seen
in very young infants rather than in those of more advanced age.

Such children are cumciated, sometimes atrophic. They appear to
be constipated because of lack of food, and not infrequently this
apparent constipation is soon relieved by a sufficient amount of
nutriment. Constipation resulting from a superahundance of starch
in the food is easily cured by the withdrawal of the injurious substance.

Constitution produced by too much casein in the food will be relieved by diminishing its quantity. The proportion of easein in the food of infants should never be more than one per cent. Besides, this amount of easein ought to be copiously mixed with a glutinous detection (reamed) as long as constitution lasts. Infants that have been fed on starchy food, or even such cereals as barley, should have outmeal substituted for it.

Constipation depending on tack of sugar is very often speedly relieved by increasing the quantity of sugar in the food. This is the case not only in artificial feeding, but also when the children are fed normally on breast-milk. Such mother's milk as is white and dense, and contains a large amount of casein, is made more digestible and will produce better evacuations when a piece of leaf-sugar dissolved in tepid water or in oatmeal-water is given previously to every mursing. Older children will take honey to advantage as long as it does not add to the almormal gastric acids, or a teaspoonful of fresh butter, and should have a moderate dose of cream added to their food. Regular doses of cod-liver oil, given twice or three times daily, will obviate or relieve constipation, besides fulfilling other indications. But it is self-understood that it must be pure, and not adulterated by the fashionable admixture of calcium phosphate. Children of more advanced age and with good gastric digestion will be benefited by breads containing busk. Children of any age will be benefited by drinking large quantities of water.

RESCRITTS is sometimes the result of protracted intestinal disorders. Therefore proper feeding is an absolute necessity. Animal food must predominate, but meat ought to be lean. The so-called erethic rhachitis of thin, nervous children requires less meat, but more of the better class of farinacous foods,—viz., barley and outmeat, with boiled milk and salt. The same indications are valid for all the conditions subsumed under the head of scrotula. Coarse bread, acidulated food, and fruit not absolutely ripe should be avoided. The introduction of phosphates, in whatever shape, is a mistake, for the following reasons:

In the careful experiments of Foster, who fed infants on milk, it was found that the mineral constituents were absorbed least (still leas than fat). Of the ushes of milk, in general, there were in the faces 36x3 per cent.; of the calcium, in particular, seventy-five per cent. In spite of that the baby throws and increased in weight in one week one hundred and seventy grammes. Thus there appears to be but very little need of salts on the part of the growing liaby. The infant of two and a half years receives in one day 1.25 grammes of calcium, of which there is an elimination of one gramme in the faces and o.o3 in the urine. There is then a behave of 0.3 gramme in a day, of 2.1 in a week, of a kilogramme, or two pounds of calcium, in a year. This is all that is utilized.

Almost the entire quantity of calcium in the body is deposited in

the bones, which contain eleven per over, of calcium in the adult and in the infant and child somewhat less.

There are some very important practical points connected with the results of these observations.

So long as the food contains plenty of calcium and phosphoric acid there is certainly no indication for the introduction of the same in the form of medicine, or as an addition to food, for the purpose of improving matrition. Thus the combination of cod-liver oil with phosphate of lime, which has become so fashionable, is based upon an illusion concerning its alleged efficiency. Besides, the empirical observation has been made also, at a very early time, that immediately after the administration of preparations of calcium there was increased elimination through both the faces and the urine.

Thus, as there is no actual absence of calcium phosphate in the food, the organism should be spared useless labor. In occasional cases, where the effect appears to be favorable, this very effect is different from what was intended. When rhachitical or anismic infants are supplied with phosphate of lime, iron, hismath, etc., they are generally patients who are suffering from primary or secondary enterth of the stomach, with superalemdance of acid in its secretion. In these cases the calcium phosphate acts as an antacid, inasmuch as phosphotic acid becomes free and the lime neutralizes the acids of the digestive organs.

Favax consumes nitrogen (eliminates urea), carbon, water, and also salts. These losses must be repaired, but with great care. For fever diminishes at the same time the secretion of saliva and of gastrie jrice, probably also that of the pancreatic secretion. Besides, it renders the stomach hypersethetic (nausea, vomiting) and impairs the absorbing power of all the mucous membranes. In the capillary bronchitis of the nursling, cow's milk is not digested satisfactorily. Still, nurslings will digest fairly sometimes, and lose less flesh in many of their febrile ailments than older children. A small amount of peptones is absorbed both in the stomach and rectum. In moderate fevers some sugar is absorbed, also albumin; fat in but small quantities, because of its tendency to become arid; starch finds its saliva more or less diminished; thus its amount must be carefully estimated.

Food, when given in undue quantity, may act injuriously by causing a mechanical irritation and by giving rise to fermentation. Can it thus increase the fever? Undoubtedly. We frequently see children sick with pain and fever who recover tapidly through the effect of a purgative which brings away large masses of facers. Others have what appears to be a second relapse of typhoid fever, and often in but the result of intestinal autoinfection, with a renewal of splenic tumefaction. All the symptoms vanish speedily, in many instances, when the bowels are thoroughly emptied of large offensive stools.

In ordinary fevers the food must be liquid and rather cool, in Weniting cold, in respiratory diseases warm, in collapse hot. The best feeding-time is the remission; in intermittent fevers nothing must be given during the attack except water or acidulated water, now and then with an alcoholic stimulant: in septic fevers nothing during a chill, except either cold or hot water, according to the wishes of the patient, with an alcoholic stimulant. Common ephemeral catarrhal fevers may do without food (except water) for a reasonable time. Sleep must not be disturbed, except in conditions of sensis and depressed brain action. In both there is no sound sleep, but sopor, which should be interrupted. In sepsis (diphtheria and other) this rousing from sopor is an absolute necessity. Unless they are roused frequently to be fed sufficiently and stimulated freely the patients will die. Besides, in most of the cases the temperatures are not high and there is no contraindication to feeding on that accivent.

Chronic inflammatory fevers bear and require feeding as generous as it must be careful. Altogether, however, it requires the good indgment of a well-informed physician to take into account the possible influences of individual habits and energies, of ages and sexus, of constitutions, and of climate and season.

Typnom payer is of long duration; its temperature is sometimes mite high in children, when of more advanced age. The lower part of the small intestines is affected principally. Thus, not only it. after the first few days, a fair amount of food required, but it must be so chosen as to be digestible in the upper part of the alimentary carol; its proper selection is the more important the more the latter organ is impaired by high temperatures. Besides plenty of water or acidnfated water (hydrochloric, no organic, acid), albuminoids are indicated. Milk and cereals (in decoctions, which must be strained) are the peoper foods. The administration of stimulants, both as to quantity and to time, depends on the character of the individual case and the power of resistance on the part of the patient, besides on the condition of the heart. When the latter becomes feeble at an early period, besides heart stimulants (digitalis, sparteine, caffeine, camphor), alcoholic stimulants are required. Diarrhox demands (besides onium, naphtaliw) albumin, rice-water, arrow-root, mutton-brothHemorrhage, which fortunately is very rare in children, forbids food in any shape for a time, the duration of which depends on the general condition of the patient. At no time during the disease and during the first ten days of fully established convalencemes should the food be solid. No purging vegetables must be allowed until three weeks have clapsed since the beginning of apyrexis. When milk and cereal food become distasteful, a change in their proparation, as described above, is indicated. During most of the time broths of mutton, beef, or chickon may also be given, or beef-juice or peptones diluted in water or in broths. The large majority of relapses are thue to a dereliction in the strict rules of feeding.

The diet in other chronic or sente diseases is regulated by the general rules which have been laid down before. Thus, a few words may suffice.

HERDETARY SYPHILES contraindicates the employment of a wetnurse. The infant's own mother may murse it if she can.

CERTIFICAL TOSTLASTS CONTRAINDICATE alcohol, coeffee, hot somes, and solid foods. Cerebro-spinal meningitis results in speedy loss of weight and strength, particularly through severe and protracted vomiting and the greatly impaired appetite. In these cases feeding must be insisted upon. The feeding-cup and feeding through the nose (usually no tube into the osophagus when there is much comiting) must be resorted to.

RESPIRATION DISEASES require liquid food. Jürgensen's recommendation of roasts, and of bread with butter (particularly the first), is objectionable in every acute inflammatory case. Food and drink must not be too cold. Sugar and sweets in general are permissible in small quantities only. Farimacrous foods are the most reliable ones. In the beginning no alcoholic stimulants. They will be required when debility and collapse set in at an early time or in protractor cases. Capillary broughitis is often complicated with gastro-enteritis, and then no milk should be allowed; sometimes even breast-milk is not digested.

Acure nexat precases contraindicate alcohol in any shape, particularly been; also spices, coffee, and tea. Cursoone terrat instaxes require generous feeding, because of the copious loss of albunia. But—contrary to Oertel and Loessenmayer—no eggs or meals ought to be given in any quantity of at an early period. Milk and farinacea must take their places. Alcohol, as a stimulant, is permissible in organi cases only. Salt must be avoided except when the secretion of urine is to be fostered. It ought not to be forgotten that appetite and digestion may be suffering from the fact that the this is another reason why eggs and meats ought to be avoided. If required in the later stages, peptones may take their place, but in small quantities only. Allomoses, such as somatose, are a good addition to the food, easily borne and readily absorbed. Milk in any shape and preparation is the main article of diet. It has no such nuclein as favors the formation of une acid, and no extractive matters which contrainsticate the use of dark meats in diseases of the kidneys. Unfortunately, it does not contain a sufficient quantity of iron to correct the loss of harmoglobin. That is why an exclusive milk diet is not borne a long time, and should be corrected by cereals and fruit. The old practice of administering chloride of iron finds its explanation therein. In renal dropsy water should not be withheld. In cardiac and begatic dropses it may be refused, but its absence in renal disease may cause america and death.

Acure aucumarism requires milk (also farinaccous) diet and vegetable acids (lemonade), the latter as long and at such times as they do not interfere with the milk food.

RECTAL ALIMENTATION.

The colon absorbs very readily both medicines (effective mostly in the same doses that are administered by the mouth) and foods, though more slowly. The execum and rectum have this faculty more than the intermediate colon. Absorption may be increased by the greater pressure of large quantities (not always practicable in the living parient) or by local irritants, such as sodium sulphate. It is understood, however, that the colon cannot forever take the place of the upper part of the alimentary tract. A dog of Barbiani (Policinico, 1901) died of starvation in sixteen days, with a loss of two thousand five hundred grammes; one with nutrient enemata without stimulation of the colon in twenty-six days, with a loss of two thousand much hundred and sixty grammes; a third one with chemical stimulation preceding his nutrient enemata in forty-three days, with a loss of three thousand grammes.

The rectum absorbs carbohydrates, flour, wine, sodium chloride, sugar, egg (very slowly), but it does not digest. Whatever, therelore, is to enter the circulation through the losser end of the almentary canal must be dissolved before being injected. Suspension alone does not usually suffice. Water can be introduced in quantities of from twenty-five to one hundred grammes (one to three ounces) every one, two, or three hours, and may thus save life by adding to the contents of the thirsty lymph-ducts and empty blood-yessels. Salta in a mild solution, with cane-sugar, which is transformed into grapesugar, and emplsionized fat, will thus be absorbed. Food must be more or less peptonized before being injected. Albumoses (for instance, "somatose") are readily absorbed in the rectum, so are also the peptones mentioned above when fairly diluted. When too thick thes are not absorbed, become putrid, and a source of irritation. Milk ought to be peptonized. The white of one egg becomes absorbable through the addition of one gramme of sodium chloride. If autritive enemata are given at regular intervals, the quantity of albuminoids in each should not exceed twenty-five or thirty grammes (one ounce). Otherwise, putrefaction with its consequences will set in, both locally in the intestine and generally in its effect on the condition of the blood. Kussensei heats two or three eggs with water, keeps the mixture for twelve hours, and injects it with some starch de-The latter is partly changed into dextrin. Fat, when mixed with alcohol, is ant to be partly absorbed. Andrew H. Smith recommends the injection of blood. Its soluble albumin, salts, and water are readily absorbed; more we ought not to expect. Still, by has observed that the evacuations of the next day contained none of the injected blood. Whatever we do, however, and be the rectum ever so tolerant, not more than one-fourth part of the nutriment required for sustaining life can be obtained by rectal injections, and inamition will follow, though it he greatly delayed, and though the sensation of hunger be tolerable, particularly after one or two days have passed by. Finally, children are not so favorably situated in regard to nutritious enemata as adults. In these the lengthening of the nozzle of the syringe by means of an elastic catheter permits of the introduction of a large quantity of liquid; indeed, a pint and more may be injected and will be retained. But the great normal length of the sigmoid flexure in the infant and child, which results in its heing bent upon itself, prevents the introduction of an instrument to a considerable height. It will bend upon itself; besides, a large amount will not be retained by the feeble or resisting roung patient. Moreover, the rectum is straight, the sacrum not very concave, and the splineter feelile in the very young. The amount can be somewhat increased by raising the haby by his feet, while the chest and abdomen are supported by a soft pillow, and by injecting quite slowly or, rather, allowing the liquid to flow in from above downward. While the procedure is going on the abdomen should be gently manipulated. When a long, solid instrument is used it is and to be felt high up in the abdomen. This is the result of a large portion

of the intestine being pushed upward with the tube, and gives rise to mistakes as to the efficiency of your treatment.

The ingentity of the practitioner will sometimes be severely taxed at regard to the choice of the maxture to be injected. Boas recommends for an adult two hundred and fifty cubic centimetres (eight onnes) of milk, the solks of two eggs, a gramme of table salt, a tablespoonful of claret, and a tablespoonful of diastased larinaceous-food: Dujardin-Braumetz, one glass of milk, the solk of one egg, two or three tablespoonfuls of liquid peptone, five drops of laudanum, and one gramme of sodium bicarbonate. The injections ought not to be too watery, and of the temperature of the body. When the recrum is very sensitive, the addition of a mild opiate is advisable at all events; sugar, alcohol, and whatever is apt to irritate the recrum should not be given in large quantities. Straining and abdominal pressure generally may be overteene by supporting the perincum and compressing the sphincoer. (See also p. 66.)

FORCIBLE FEEDING.

When children or infants refuse or are unable to take food, forcible feeding should be resorted to. A proper amount of liquid food, from one-quarter of a pint to a pint or more, according to age or to circumstances, should be introduced into the stormels several times a day by means of a sound of proper size. The procedure need not last longer than a few minutes, and the tube should be drawn out quickly so as not to irritate the pharyna.

Nasal feeding is best accomplished through a small finnel which, to avoid pain, terminates in a short piece of India-rubber tubing. This is introduced into the larger nostril, the patient is held firmly on his back, and just enough food is poured in to allow the child to swallow. A small syringe from which the piston has been withdrawn may take the place of the funnel.

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General Therapeutics

THEMATEUTIES of infants and children has had its stages between the era of shall and ignorant prescribing and that of impotent and conceited minitism and of churlish passimism. But neither a deluge nor an absence of drugs makes a physician, nor do they contribute, when alone, to the welfare of a single individual or of the community.

The first indication in therapeutics is a correct diagnosis. The most efficient treatment is local, and the cause, seat, and essence of a morbid process should be known, or at least sought for. Many a diagnosis at the present time is still simply symptomatic, though less so than in hygone times. Half a century ago, or less, symptoms like paralysis, convulsion, dropsy, or jamilies were considered full-fledged and sufficiently scientific diagnoses; to-day even chlorosis, pernicious amenia, diabetes, epilepoy, and many others require etiological differentiation to be understood and appropriately treated. The most promising therapy of the future—scrotherapy—owen its origin and importance to nothing but an accurate bacteriological diagnosis.

Much has been said of the difficulty of a diagnosis in the diseases of infancy and childhood, and the consequent difficulty experienced in treating them. I do not believe that the diagnosis in the case of an adult is much easier; in many instances it is more difficult. The latter will often mislead you intentionally, or because he is carried away by prejudices and precesserived notions; the former may conceal by not being able to talk, but will certainly not tell an intruth. Besides, the ailments of children are rarely complicated, and usurally a single diagnosis tells the whole story. If it he not made, it is periuage best for the practitioner not to attempt much doctoring, beyond the relief of the most urgent symptoms, and for the patient to be let alone. For happily, most diseases have a tendency to get well, either completely or partially, and many will run a more layorable course when not moddled with

This does not mean, however, that I discourage treatment even in such allments as run a typical course extending over a number of days or weeks. On the contrary, I am opposed to the practice much too common—of those who do not, for instance, with to inter-

fere with a whooping-cough because it finds its natural termination after several months. This is true, but many of the children also find their natural termination during these months. Every day of whooping-cough is a positive danger. A lobular pneumonia which occurs in the second or third mouth of the disease, and proves fatal or terminates in tuberculosis, would have been prevented if the original affection had been removed or relieved by treatment. A physician advising no treatment in such cases as terminate unfavorably in this manner ought to be held responsible for his neglect. Nor do I approve of the practice of "meeting symptoms when they turn up." My responsibility is not lessened by my busying myself with subcutaneom injections of brandy when a collapse has set in which I ought to have foreseen and prevented, or with giving digitalis when on the fifth or sixth day of a pneumonia the pulse is flying up to 160 or 200. Anybody can perform that sort of perfunctory expectant treatment extending from the first call to the writing of a death certificate. What I expect of a physician is to know beforehand whether or not that individual heart will carry its owner through aw inflammatory or infectious disease without requiring stimulation. Many a case might be saved by a few grains of digitalis or another cardiac tonic or a few efficient doses of campitor or musk, if administered in time."

Altogether, it has always appeared to me most satisfactory to treat children, and particularly infants. They are truthful, unsophisticated: they are what they appear, and they appear what they are. In their pathology and therapeuties there is no mysticism, no faith-cure, no spiritism, nor any other disholism. Their diseases are seldom influenced by mental impressions and emotions, and for that trason "suggestion," hypnotism, or any other confidence game has no power over them, certainly not to the same degree as over adults. But older children may be influenced to a certain extent. Neurasthenia, neuraligias, and bysteria are not unknown among them; like strong irritations of the senses, the incautious causation of emotions and the awakening of autosuggestions may become dangers to psychical life and lead to somnambulism, bysteria, and intellectual and moral per-

[&]quot;"Our platform should be: In order to obtain indications for treatment make a diagnosis. That are is becoming both more accessible and through bonest and hard work, more easy with the aid of modern methods. Remember that most diseases have, indeed, a tendency to spontaneous recovery, but also that recovery is not always complete and that invalidates should not be invited through neglect of treatment." (Treas of the Med. Soc. of the State of N. Y., 1901.)

versities of all kinds. Imitation, or emotional contagion, in a schoolroom leads to chorea, or a dormitory to enuresia. Children's nature
and that of their ailments are simple enough, but you must know
how to understand them. Unfortunately, however, for incompetent
practitioners, children are no mere miniature editions of adults, and
their ills and whims and peculiarities must be known, patiently
studied, and, together with the ignorance and the prejudice and
caprices of the parents, endured.

Though pediatries is no specialty like, for austance, ophthalmology, and the practice prevailing in Europe, mainly in Germany, on the part of those who are in the market for business and reputation, of advertising themselves as children's specialists ("Kinderarzt"), both bulicrous and reprehensible, there is enough in the physiology and pathology of infancy and early childhood to justify the most careful attention to their peculiarities, mainly on the part of those who have baid a solid foundation of general medical study. This is essential. That is why pediatries should form the most important branch of the very last year-the fourth with us-of a medical enriculum. In the contemplation of the healthy and of the morbid condition of the soung the lirst consideration is the imperfection of the tissues. Cell-growth is still or is ast to-remain embryonal. That is why hemorrhages are so fryguent soon after birth and why most timors encountered in later life have a foetal origin. Voluntary and involuntary insicular action. at that age is insufficient. Circulation is different from what it is to be, the heart is comparatively large and strong, the arteries in part larger (carotids, repal) compared with the size of the organs they supply, and compared with their own size as attained in later Digestion is not competent compared with that in adults. Its muscular action is defective, and the gastro-intestinal secretions not equal to those of advancing growth; still, it should be known that the differences are not so great as prejudice or the obstimey of often refuted impressions will have it. For to this very day there are immumerable men who will simply not submit to what has often been and may easily be proven to be a fact, that the newly-born has a diastatic amylum-digesting forment in his salivary glands. The persons system of the newly-born is but little receptive, is still less apt to exhibit reflex action than later on; in the young infant the inhibitory function is scantile developed. The most characteristic feature of the young is his growth; developmental diseases are very frequent. To this class belong those of the locomator system, ostellis and eniphysitis of every kind, including spondylitis, rhachitis, and scolings; of the nervous system, such as meningitis and energhalitis; of the lemphatic aystem, such as adenoids, hypertrophics of the tonsils, adenitis, periadenitis, and polypi of the rectum. In close connection with his disseders is the congenital condition of mucous membranes. On the combination of the imperfect or morbid condition of those two rests the condition we call serodula. The respiratory organs have their own peculiarities; their inflammations have a peculiar type in early years, and the narrowness of the largus explains many of the imminent dangers connected with even a thin diphtherotic explaints. Infectious fevers generally can be best studied in infancy and childhood. These are only a few instances proving that a large part of general and special nosology can be studied in infants and children only, and that both bygienic and drug therapentics cannot be complete by far without the information drawn from the morbid conditions of infancy and early childhood.

The period of puberty requires particular attention on the part of the therapeutist. There are sudden changes. The heart grows suddenly, the blood-vessels, formerly wide, are relatively narrower: the body grows, with it the head; metabolism is very active, the muscles gain strength, the sexual organs develop and send to, and derive from the central nervous system new sensations and impulses. Hereditary taints show themselves at that period, epilepsy and insanity reveal the neurotic taints of parents or grandparents; so marked are such outbreaks of developmental origin that, when intermitting, they may return during the climneteric period. Growth may stop, boxever, at that time; small stature, deformity of the gouitals (with or without herria), absence of beard may explain and detect the pre-Vions criminal. In milder cases there are general feebleness, neurosis, bendaches, chlorosis, menstrual irregularities, changes of character, with or without susmism, or the onset of constitutional diseases. No new diseases need appear about this period, but the impressibility and sulnerability of the nervous system, the tendency to anamia occasoned by the sudden growth, and the frequent lack of harmony in the development of the different organs are able to start hidden diseases. and tendencies, and require the most painstaking care of the judicious practitioner in regard to diet, largiene, and medicinal therapeutics.

There is one all-important principle in treating infants and children which cannot be repeated too often. They are very liable to become anaestic, to submit to general immition, and to suffer from fullure of the heart in spite of its anatomical and physiological vigor. These facts render it urgent that the physician never lose sight of the general condition of the patient while attending to a local disorder

Good treatment is always preventive; it should save strength, if

any be left, and provide at once for such comfort as will facilitate physiological functions. Do not insist, at the cost of a patient's lefe, upon having a very accurate local diagnosis when a pleuritic baby with a pulse of 180 and agony imprinted on its pinched, flushed face appeals for mercy. It may die while and because you are satisfying your "scientific" interest. Or when a patient, old or young, gets into a bospital ward after a tedious ambulance trip that exhausted whatever studity was left, let there be no routine bathing and no close examination until the patient has been resting and a stimulant and probably food have been administered. To act differently may kill him.

Then, attention must be paid to the way the sick are placed or kept in bod. As long as they are conscious they will aid the doctor in determining their posture; but grave infectious fevers, such as meningitis, influenza, typhoid, etc., impair consciousness and the selfprotection it affords. A patient must not be allowed to rest on the same side always. Hypostatic congestion of a lung may be prevented or even cured by proper alternation. Gangrene may thus be prevented. Other suggestions which should force themselves on the attentive physician, and might be multiplied, are as follows:

Congestion of the cranial cavity and meningitis require a rather erect or at least semi-recumbent posture. Convulsions thus originating may be relieved by changing the horizontal position into one more vertical. Care should be taken, however, not to raise the head alone and thus interfere with the circulation of the neck. The trunk must be raised with the head at the same time. Be also sure that no feather pillou or mattress add to the internal heat. Arcenia of the brain requires a horizontal or nearly horizontal position; temporary syncope, a temporary lowering of the head and upper part of the trunk even below the horizontal level.

Spondylitis requires absolute rest on a mattress, no matter whether inherendous or transmatic; the former is more frequent, and in its incipient stage may heal with rest and general proper treatment. The latter will, however, never suffice without the former. Marked ritarbitis requires rest. Bending limbs should be discouraged from walking, softened cranial spots protected by a hollow air or hair pillow, and bending ribs and spine demand carrying in a well-limed trace (posteboard, leather, wood, felt, wire) until after months the bones are sufficiently hardened. A rhachitic child should never be carried on the arm before the hones are hardened, and surely not persistently on the same (right) arm. Sections is the invariable result.

Children suffering from retropharyngeal abscess, pharyngeal philegmon, or larvageal obstruction bend their beads back to facilitate respiration. Lintil fully relieved, their beads should be supported in the position voluntarily assumed. In incipient pleurisy they will try to lie on the healthy side; when effusion has taken place, however, on that of the effusion, to give fairer play to the healthy side. In local pneumonia, mainly of the upper lobe, a rather erect position is preferred; in a total pneumonia of a whole side or an extensive lower lobe affection most patients prefer a nearly horizontal position, with slightly raised head only, to permit extensive excursion of the displacem and the co-operation of abdominal respiration. Heart diseases with dilatation and hypertrophy and pencardial ellisson require semi-recumbent position in bed or erect posture out of led. Dilatation of a bronchus and abscess or gangrene of a lung demand posture on the healthy side; thus expectoration of the putrefying or putrid mass is facilitated. Moreover, in that position the inhabition of disinfectants is pendered easier. During pulmonary hemorrhage the patient should. if possible, lie on the affected side to prevent to some extent the blood from running into the healthy lung.

Proper feeding and nursing of the infant prevent the numerous gastric and intestinal diseases of the earliest period, which either destroy life at once or lay the foundation of continued ill health. For that reason a rather large part of my literary labors has been dedicated to the questions of diet and hygiene. These and medication belong together. That is why the first chapter of this work necessarily contained some remarks on medication, and this one, dedicated to therapeutics, cannot abstain from referring to diet. Those who still object to drug medication on the "principle" of ignorance, or norse, are requested to kindly determine the boundary line between medicinal and Ingrienic agents or products. Attention to respiration and circulation and to the functions of the skin are of similar moment. Their requirements will be discussed in special chapters. The subjects of elimate, massage, electricity, orthogorfics, and gymnastics will find their places with the diseases of the lungs, muscles, nerves, joints, etc. Bathing, cold washing, exercise, and sufficiently long interruptions of school hours to avoid exhaustion are subjects of vital importance. Physicians and humanitarians have declaimed against permature schooling, too long hours, too short recesses, and objected to the overcrowding of the curriculum and to the vanity of incompetent school-masters and mistresses who utilize the pose victims in behalf of exhibitions; mostly in vain thus far. A child of seven or nine years should not have more than two or three hours daily, one of which

should be spared for intermediate recesses: from nine to twelve years. the school hours should be three or four, after that age not more than five hours, with frequent and ample recesses. If the mentally slow were taught separately, bodies and minds of all classes of children would be benefited beyond the possibilities of a hot-house instruction. The best exercise of the child is play in open air. Compulsory gymmatties in bailly ventilated localities cannot take its place successfully, and may add to exhaustion and ill health. It is an unfortunate fact that when the claims of physical development were arged upon school authorities, gyomastics were added to the overcrowded curriculum as a matter of business necessity, or of conviction, not always willingly or intelligently. The summer vacations of public school children ought to be four weeks longer than they are. The public schools ought to be closed about the middle of June and reopened in October Many years ugo the Harlem Medical Association and the Medical Society of the County of New York requested the Board of Ednestion of the city to open the public schools on the third, in place of the first, Morslay in September. The soundness of the principle was appreciated, and the necessity for such a change was arknowledged by the authorities, and there/ore (1) the second Monday of September was selected for the beginning of the school season, so as to afford the children an extra week's broiling in the city sun and an opportunity to lose, as they did formerly, the benefit derived from the smumer vacation. The sanitary reason for this loss of a beneficent opportunity was said to be the virtuous anachronism of an eighteenth-century school superintendent, still in office in this twentieth century until a few months ago, who said he preferred the influence of the schoolroom to that of the New York streets for the New York boy. The good effects of the excursions of the St. John's Guild and the air lemds and of the Sanitaria of the Guild and the Children's Aid Society, and many other sensible charities, are steps in the right direction.

The beneficent influence of fresh air is enhanced by that of light. Rooms situated toward the north exhibit a musty ofor compared with those directed toward the south. Sunlight exidizes organic substances and destroys bacteria. Light without warmth has been recommended against bacilli, applities, forunculosis, and lupus. Others recommend against the latter light and warmth, as also against rhomatism where it is said to cause perspectation without urea, and against neuralgias: the same is recommended for the increase of erathrocytes and lumnoglobin. Old clinicians and physiologists appreciated the influence of light. Wimbow charged insufficient light in the bouses with being

the cause of retardat mental and physical development and of machitis. Moleschott knew the aloumess of metabolism in children urben not exposed to light. In light the elimination of carbonic acid and the assimilation of oxygen are increased. In open air the temperature of the body is higher by 0.5° C, thun in dwellings. It is true, however, there is the additional influence of air (and exercise?).

The subject of banking, or rather of hydrotherapeutics in general, deserves some preliminary remarks in connection with a future discussion on "bathing." There is hardly a topic which deservedly has attracted the attention of the profession (and of the public) in the last decade or two to a greater degree than that of water and of its mes as a remedy. As I am writing to history, I mention left two (modern) names that merit most crofit in outlining both the indications and the methods of its uses, Winternitz, in Europe, and S. Baruch, in America. Cold water was long believed to have an antisyretic action only. Now the indication to reduce the temperature of the body arises when an excessive frequency of the pulse, degeneration of the tissues of the heart and other muscles, of the kidners. and of the brain, dryness of the mucous membranes, and impairment of absorption appear to result from it, but from it alone. Cerebral symptoms, such as delirium and convulsions, are then not uncommon. Particularly is that so in the onset of a disease, while the same temperature may be readily enforced at a later stage. That is who the elevation of temperature alone, without the above dangers. either present or feared, should yield no indication for antipyretic treatment; indeed, many a child bears easily a semperature which carries danger to another; and there are high temperatures in some diseases, such as many forms of typhoid fever or of intestinal autoinfection, which do not seem to interfere much, for a while at least, with the case and comfort of the patient. Unfortunately, however, the thermometer, ranging 103° F, or more, is often pennitted to estabish indications, and the reduction of temperatures appears to become a fad and the only admostledged duty of many practitioners.

To reduce temperatures we have drugs and water. Of the former, quinine should not be relied on except in mularia, also in some septic favors, when it may be used by itself or in combinations during remissions. The coal-tar preparations, antipyrin, salopyrin, betophenia, phenacetin, etc., will all reduce temperatures, and have their occasional indications, but are known to depress, one more the other less, the action of the nervous system and the functions of the heart, and even to destroy blood-corposcles. Acetamilid has the latter effect more than my of the rest and should be discarded altogether. Their

administration requires the utmost care, and frequently demands the combination with stimulants to guard against detrimental effects.

The temperature of the young body is easily inflatenced by apparently slight causes; it may rise and fall almost studenly. A student rise and a continuous heat may prove thangerous; remissions and intermissions are loopholes for ascape from dangers. These dangers are not so much the direct result of a high temperature as of the toxic effect of circulating microbes or their produces. A modesate degree of temperature is well tolerated and should not be interfered with. In many cases it should be looked upon as a reaction of the organism only and in others should be considered welcome by its effect on the destruction of microbes and toxins and its favoring the formation of antitoxins in the infected blood and cells. Not infrequently the very worst and most imminageable cases of sepsis, diphtheentic, scarlatinous, or puerparal, run their had or fatal course with low temperatures, while those with high temperatures will recover.

Water, when properly employed, lowers the temperature, but has none of the depressing effects of the coal-tar antipyreties. On the contrary, it stimulates the nerves of the skin and by reflex these of the whole system, particularly of the heart; it increases heart and arterial pressure, thereby aids oxidation of tissues and disresis, and appears even to increase the amount of hamoglobin and of red cells. In this respect there can be no longer a difference of opinion; but in regard to the use of cold washing, with or without friction or affusion, of packing, of ice applications, of hot, warm, or cold biths, of the duration of an application or of a both, and of the degree of temperature requiring or permitting their employment in an individual case, no inon-clad rule will ever hold good.

A cold bath (from 60° to 75° F.) is seldom, if ever, appropriate for a haby of less than eight months or a year, and never in congenital heart disease. If given at all, it ought to be interrupted when the child begins to shiver or the lips become blush; a cannot be expected to have a good effect unless the feet share immediately in the reaction which should take place after the bath. A cold bath should, according to circumstances, sometimes be preceded or followed by the administration of a stimulant, and usually not be extended beyond four or five minutes and be accompanied by friction of the surface, mainly of the extremities. A warm both (from 85° to 98° F.) differs so much from the temperature of a feverish child (from 10° to 107° F.) that a reduction will also be readily accomplished by it. Besides the patient sufferits to it more readily. The

temperature of the bath decreases from minute to minute, or, if necessary, may be lowered by adding cold water. A warm both, when given for the purpose of reducing transcratures, should last longer,from five to fifteen minutes,-and may be given a number of times daily. After a cold bath the child should be covered warmly, partieslarly the feet, at least until the conneous circulation is fully restored: after a warm both the covers should not be too heavy, in order not to lose the benefit of copious radiation from the surface. Packs of cold water, iced or not, need not, in most cases ought not to cover the whole body of the child; arms, feet, and legs should be left out. A single thickness of a common towel or naplen is wrapped around the body. exclusive of the arms, either the chest alone, or the abdomen alone. or both, and the thighs, according to the more local or more general effect which is to be attained; and a layer of oil-silk or rubber cloth, and over it a flannel sheet or blanket should cover the pack. More minute instruction on this point will be found in Chapter III. To reduce local congestion or inflammation (conjunctivitis, peritoritis, arthritis, meningitis) cold water, ice-water, or ice-logs may be used. Small children do not tolerate ice applications to the hear for any length of time, collapse resulting the more readily the thinner the abail. Applications should not be too wet; small pieces of cloth cooledon a lump of ice should be frequently changed in cases of conjunctivitis. Extensive meningitis requires at least two ice-hags, the effect of which should be carefully watched.

Cold applications, well urung out and covered with flamed and oil-sills, to small or large surfaces, and allowed to remain from twenty to fifty minutes must the skin is hot, are efficient stimulants. Hot baths (from 96° to 105° F.) act as stimulants, but should be given sparingly and he of short duration, as too exciting or exhausting, when lasting long, for most patients. The head must be cooled while the body is immersed. Short hot baths, with or without mustard and with or without cold applications to the head, dilate the superficial blood-vessels, and will be found useful in an occasional case of pneumonia, in collapse, or to favor the cutaneous eruptions of scarlatina and of measles. After removal from the bath, the patient should be covered with hot blankets, and a bot drink, such as water, an aromatic tea, or milk, should be given freely to promote perspiration.

When hathing is resorted to as a means to lower or to increase blood-pressure, the effect of medicines given at the same time should be taken into consideration. Morphine lowers it, digitals increases it; a bath to counteract the effect of morphine should have a lower temperature; to relieve that of a dose of digitalis, a higher temperatime." That is why the dose of a bath—that means its temperature and its duration—should be adapted to the normal and the morbid conditions of the individual patient.

Became of its grave importance, I repeat here that milk and drinking-water are safest when boiled. It is to be hoped that, when ever fresh and fairly sterile milk cannot be obtained, the method of sterilizing milk devised by Sochlet, of Munich, and introduced in New York by Caillé, and systematically employed by Roech, of Boston, and his followers, will prove successful. Mental and physical labor ought to be easy and pleasant. Factory work for children is an abouination, and not only a cruelty committed against the individual helpless child, but a danger to the future of the republic, which cannot be expected to thrive while the physical and intellectual development of the future citizen is crippled by the greed of the manufacturer and the recklessness or the partiality of legislatures.

It is evident, therefore, that preventive medicine is coming to the from as the main reliance of the future, in which the public-spirited and well-informed general practitioner will again be recognized as superior in breadth of horizon and good citizenship to the merely dexterons specialist. Besides preventive medicine, drug therapeutics has not been left behind in the evolution of practical medicine. Since the times of Magendie, who supplied in with the first alkaloids, the laboratories of the pharmacologists, both in professional chairs and in factories, have added to our exact knowledge of drugs and their effects. At the same time physical therapenties has developed senultaneously with drug therapeutics. The claim of some of the most modern writers, however, that physical therapeutics, such as hydrotherapy, electricity and galvanism, and the study of climate, is an accomplishment of the last few years, is not justified by the history of therapenties. Only the books get bigger and sometimes out of proportion to our increased knowledge. Physical therapeutics has been estalled as "merely aids to natural processes," and "not medicines in the usual meaning" of the word. On that score superiority has been claimed for it. What that expression means I am at a loss to explain. I do not take a medicine to be a bullet that kills a disease from afar, nor a rope that strangles it. The enthusiasm of "physical therapentists" has sometimes grown into familicism. Bors physical therapenties militate against drugs? make them innecessary, meless, or injurious? If water and mussage and electricity are "natural" aids. are iron, digitalis, mercury, arsenic, alcoholics, or acids "mnatural"?

⁴ Karl Lower, Phys.-Diat. Therapie. Wiener Klinik, No. 8, 1000.

The narrowness of some minds cannot be better demonstrated than by the angry shopkeeper rivalry of doctrines or teachings or therapentical aids meant to work for the same legitimate and humane ends.

In the administration of medicines excitement on the part of the patient must be avoided; the nervous system of infants and children loses its equilibrium very easily. Fear, pain, screaming, and struggling lead to disturbances of the circulation and to waste of strength. Preparations for local treatment or for the administration of a drug sout be made out of sight, and the latter ought not to have an unnecessarily offensive taste. Naphtalin, iodoform, beta-naphtol, rhiharb, and such like should be shimned. The absence of proper attention to this requirement has been one of the principal commendations of "homocopathy," whatever that may have been the last twenty or thirty years. Still, the final termination of the case and the welfare of the patient are the main objects in view, and the choice between a badly tasting medicine and a fine-looking funeral ought not to be difficult. In every case the digestive organs must be treated with proper respect; inamition is easily produced, and comiting and diarrhosa must be avoided, unless there be a strict and urgent indication for either an emetic or a purgative. The most correct indications and most appropriate medicines fail when they disturb digestion; it is useless to lose the patient while his disease is being cured.

The administration of a medicament is not always easily accompashed. Indeed, it is a difficult task sometimes, but one in which the tact or clumsmess of the attendants has ample opportunity to become manifest. For "when two do the same thing, it is by no means the same thing." Always teach a nurse that a child cannot swallow as long as the spoon is between the teeth; that it is advisable to depress the tongue for a moment and withdraw the spoon at once, and that now and then a momentary compression of the now is a good adjuvant. That it is necessary to improve the taste as much as possible need not be repeated. Syrups turn sour in warm weather, glycerin and saccharin keep; the taste of quinine is corrected by coffee (infusion or syrup), chocolate, and "elixir adjuvans." a teaspoonful of which, when mixed each time before use, suffices to diagnise one decigramme = one and a half grains of quinine sulphate. Powders must be thoroughly moistened; unless they be so, their adherence to the fauces is apt to produce vomiting. On the other hand, their prescription and preparation require care; for instance, many powders absorb moisture, such as acid phosphates,

sodium bromide, calcium chloride, piperazin, lysidin, chloral bydrate, dry vegetable extracts, eatracts of animal organs, citrate of iron and ammonium; others form a fluid when in combination, for instance, antipyrin; others. Inc iodides, resorcin, and aristol, change their color. Air-tight boetles or the addition of licorice powder correct some of these changes. Capsules and wafers are out of the question because of their size; pills, when gelatin-coated or otherwise pleasant and small, are taken by many. The recrum and the nose may be utilized for the purpose of administering multicines in cases of trismus, escatricial contraction, or obstreperousness. Both of these ways it may become necessary to resort to for weeks is succession.

The rule not to prescribe incompatible medicines is valid at every period of life. For the treatment of children the following faces should be remembered. Corrosive sublimate should be dissolved in alcohol or in distilled water with the addition of sodium chloride. Caleniel and iodides should not be given together or in close succession; caloniel cannot be mixed with calcined magnesia; potassium permanganate not with syrup, or with tannin, sulphur, glycerin, alcohol, or awest spirit of nitre; potassium chlorate not with earbon or with sulphur; alkalies not with alkaloids; gallic acid not with alkaloids or albumin.

The effect of a medicine depends on its dose and the readiness with which absorption and elimination take place. Medication, when its effect is wanted speedily, should be continued during the night: mainly in such patients as have bealthy kidneys. In infants and children sodium saliculate, for instance, is readily eliminated, much more rapidly than in advanced age. Both absorption and elimination are very active in infancy and childhood; but they vary. Curare, for instance, is eliminated speedily, and must be repeated quite frequently: potassium iodide soon after its administration, but there are traces in the urine after some days; phospitate of lime appears in the urine and faces directly; potassium chlorate is excreted through the kidnors within a few hours; silver and mercury may take a long time in exceptional cases. Absorption takes place the more readily the more the solution in which the medicinal substance is held is diluted: but it depends greatly on the condition of the surface or tissue which is selected for the introduction of the drug. A horny skin absorbsbut little; immetions require a clean surface, and are bost made where the epidermis is thin and the net of lymph-ducts very extensive, on the inner aspect of the forearm and the thigh. A congested stomach, a catarrhal or interacted rectum, are more or less indident and disap-

point our expectations quite frequently. High temperatures of the body exert their influence on mucous membranes and their secretions and absorbing powers, so that absorption and efficacy are distinished or annihilated. That the doses must be adapted to the ages of the patients is self-understood; but to establish fixed rules is more than merely difficult. To give as many twentieths of the dose of an adult. as the child has years is a fair average; but this rule suffers from very municious exceptions, like all the other rules that have been decided upon not at the bedside but at the writing-table. Like foodswhich are tolerated by the adult, but are not tolerated by the young. though the amounts be diminished in proportion to their years. so there are medicines which are not borne by the infant. Nor are the doses the same for every adult. As healthy persons thrive on different quantities of food, so there is a variableness in the amount. of medicines required for full effect. Besides, there are idiosyncrasics which in some forbid the use of a medicine apparently indicated and borne with success by others. There are those who respond quickly, and sometimes too quickly, to very small doses of opinm; others in whom a minute trifle of mercury produces salivation. It is this class of cases which gives rise to much disappointment and requiresall the tact and foresight of a good physician. In some the system gets used to a drug after a short time. Babies, after having taken opiates for some time, demand larger, and sometimes quite large, doses to yield a sufficient effect. Excessive doses continued a long time have produced morphinism in children as in adults. Some drugsare required in proportionately large doses. Febrifuges and cardiac tonics, such as quinine, antipyrin, digitalis, strophanthus, sparteine, and convallaria, are tolerated and demanded by infants and children in larger doses than the ages of the patients would appear to justify. Potassium iodide may be given in doses of one or two drazhous-(four or eight grammes) daily in meningeal affections, while in the same one of the heart tonics, caffeine, most be shunned because of its-under these circumstances-exciting and irritating effects. The same may be said of alcohol, which must not be administered in cerebral congestions unless they be of septic origin. Mercurialsaffect the gums very much less in the young than in advanced age. Corrosive sublimate, in watery solutions of one to eight or twelve thousand, may he given to a baby of two years with membranous crosp in doses of a fiftieth of a grain every hour or two hours for five or six days in succession, with rarely as much as the most trifling irritation of the gums or of the stomach and intestines. In urgent cases of beneditary syphilis it can and should be administered on a

similar plan for weeks, and, somewhat modified, for many months, to be recomed after an interruption of weeks, and later on of months.

If it be the object of medication to accomplish an end and to fulfil an indication with the least expense to the organic economy, and within the briefist possible time, we do not some a success in very many instances. Indeed, not every aim is reached directly and not all indications can be fulfilled at a moment's notice. As the object of enting and drinking is the reproduction and the growth of the body, as many a meal is required to produce a fasting and visible effect, and as every one of the meals is necessary for the sum total of the final results, so the administration of numerous small doses of medicines extending over weeks, months, and even years may be demanded for a certain purpose. Particularly is this so when chronic nilments of the blood, the nervous system, or tissue atomalies are concerned. To affect rhachitis, phosphorus requires weeks. The faulty sanguidcation of chlorosis is mended by iron, if at all, after weeks or months. Pernicious amenia, sarcomatosis, even chorea require the persistent and protracted use of gradually increasing doors of arsenic. Syphilis and chronic conditions of hyperplason require mercury or the iodides, or both, to accomplish the desired end, through months and even years. The organotherapy of mexicolerm or of cretinism has to be continued for months and years and resumed after interruptions. Even the effect of digitalis, as a heart stimulant and, by its effect on the smallest blood-vessels of the heart muscle, a mitrient of the heart itself, is obtained solely through the persevering administration of small doses in many chronic cases.

The dose of a medicine depends no less on the mode and locality of its administration. Modern therapeutics favors as much as possible local medication, like modern pathology, which requires local diagnoses. Subcutateous administration demands smaller doses, the rectum sometimes a slight increase. There are some medicines which are absorbed and act as well in the rectum as through the mouth; this is a subject, however, to which we shall return. The manner of application results also in different effects. The inunction of the official ointment of potassium iodide is well-nigh inert; its effect is almost exclusively that of massage, for iodine makes its appearance in the tirine after days only. Potassium iodide in glycerin, rubbed into the skin a number of times, may eliminate iodine after a day, in lanolin after a very few hours.

At this place it is well to remember the great additions to our therapeutical possibilities, though in a few words only. Our material medica has been enriched with alkaloids and enabled us to give invariable and exact doses and to render medicines palatable,—advantages much greater than those derived from electrotherapy, Röntgentherapy, or even hydrotherapy. The gigantic strides of chemistry have furnished a large number of synthetic drugs, many of them of great efficacy for good or (and) evil, and some very creditable to both the learning and enterprise of manufacturers. Serotherapy and the medication supplied by the thorough study of the duetless glands are in part due to them. But, after all, the weapons our ancestors had in the shape of mercury, iodine, opium, digitalis, and others have not become dull; indeed, modernized medicine has nothing like them, just as not one of the later or latest modern means of diagnosis excels or equals percussion and ansembation as taught eighty years ago.

Of scrotherapy I shall speak again; or govotherapy may be mentioned here. It was introduced to meet the dangers of the absence of "internal secretion." This is a term extensively employed, at first in regard to the adrenals (Brir. Med. Journ., August 10, 1805). by Schaefer and Oliver, and generally admitted to be descriptive and telling. It is applied to some of the processes, partly physiological and partly chemical, of the formation and disintegration of material in different parts of the organism. Saliva, gastric and pancreatic fulce, and hile are external secretions, and carried off by efferent ducts. Internal secretion, however, requires no efferent ducts, indeed. no glandular stricture, for it occurs also in muscle and in brain substance. Internal secretion is carried off into the lymph and blood directly. Liver and panereas appear to have both external and internal secretions; but the thyroid, thymus, spleen, and adrenals appear to luve internal secretion only. Their absence or removal or destruction by disease causes death with the symptoms of a chronic infection. This may result from one of two sources, or from both. Either those organs have the function of forming certain materials required in the organic economy, or that of destroying poisonous effete results of metamorphosis. Thus the absence or destruction or extirpation of the thymid cames cachexia, that of the panereas diabetes, that of the adrenals often Addison's disease. In regard to the thyroid, we are now certain that mexcedema and some forms of cretinism are favorably influenced, or even cured, by the administration of the thyroid gland of animals. More particulars will be found under the headings of myxordems, cretinism, exceptibalmic goitre, and others

At best, organotherapy requires patience and time. Some of its effects cannot be obtained except by administering the substitute for the absent or defective organ persistently. Myxicdemi and semicretinism are liable to relapse when medication ceases or is unduly interrupted. This will not be corrected, it is to be feared, until a normal organ is implanted into the suffering organism and made to perform its physiological functions. Thus far surgery has not succeeded in yielding the correct results.

The rection of the infant and child has been rising in the estimation of the practitioner since the times of themsometry; for it is certainly the safest and easiest place to take the temperature. For therapeutical measures it is also invaluable. Its importance for the purposes of alimentation has been detailed in a foreser chapter, (See p. 47.)

The rectum of the voring is straight, the sacross but table concave, the splineter an feeble, and self-control is attained only gradually. Thus a rectal injection is easily either allowed to flow out or whemently expelled. Therefore one which is expected to be remined must not irritate. The Mandest and mildest is a solution of six or seven parts of sodium chloride in a thousand parts of water (" saline solution"). This may be made to serve as a vehicle of medicine, unless incompatible with the latter, which it will be but rarely. A medicated enema which is to be retained should be terid and small in quantity, half an sonce or little more or less, and carried up well into the rectum, for the immediate contact with the sphincter may cause its expulsion. Care must be taken to exclude air from the syringe, which, for small quantities, must be a well-fitting piston erringe of fard rubber, with a long nozzle. This must be well oiled, and introduced, not straight, but with a gentle turn, so as to avoid folds in the anal mucous membrane (in the same way a thermometer ought to be introduced). The nozzle must not be too thin, as it is liable to be exught; the smallest nozzles of fountain syringes are therefore in most cases improper : the larger size is more appropriate for any age. The injection must be made while the patient is lying on his side, not on his belly over the lap of the nurse, for in this position the space inside the narrow infantile pelvis is reduced to almost nothing.

When medicines are to be injected, the rectum ought to be empty, as in infants it mostly is. When it is not, an evacuating injection ought to precede the medicinal one by half an hom. It ought to be of the mildest possible nature, for any irritation of the rectum, from the local effect of an enema to a catarrhal or dysenteric process, reduces its faculty of absorption. The medicinal solution must not be saturated: indeed, very soluble medicaments only are to be selected for medicinal enemata. Nor must they be acid or contain anything irritating: Alcoholic tinctures require relatively large quantities of water; quintine salts must not be selected unless very soluble, such as the muriate, the brounde, the carbamide (bimuriate with urea), or the bisulphate. The addition of a small amount of antipyrin renders quintine very soluble. No acids must be used for the purpose of beeping it in solution. Sodium salicylate, also antipyrin, exhibit their full power through the rectum, and permit of full doses. Frequently, however, the rectal doses are a little larger than these given by the mouth.

Larger enemala are not retained, and are therefore utilized for the purpose of emptying the bowels. This effect is easily obtained in infants and children, for their fæces are soft and movable, with the exception of those cases in which improper molicines (large and continued doses of calcium salts and bismuth or astringents), or badly selected food (casein and starch in undue quantities), or an excess of the normal great length of the color descendens and sigmoid flexme have given rise to large accumulations of bardened faces. Small ugantities are seldom sufficient for the purpose of relieving the bowels, unless they act as irritants; in this manner glycerin, pure or with equal parts of water, may produce an evacuation readily. Irrnants, however, should not often be used, for obvious reasons. An evacuant injection may weigh from a fluidounce to a quart, in some. It ought to be given while the child is lying down; the liquid must not erner the bowels quickly or vehemently, the fountain syringe not hang more than ten or twelve inches above the anns. If that procaution be observed, occasional pain or faintness or voniting can be avoided. If water, or water with two-thirds of one per cent, of salt, be insufficient now and then, more salt or scap may be added for the purpose of enforcing the evacuation. Half a tablespoonful of oil of impentine, with a pine of soop and water, often acts charmingly; so does the addition of a few dracture of tincture of assafortida, in conditions of constitution, flatalency, and nervous excitability, also in conculsions; or electrin in obstinate constinution. A few concesof olive oil is often preferable, as an evacuum, to involving else.

Large injections will have other indications besides that of evacuation of the howels. In many cases of intense intestinal catarrh large and hot (from 104° to 108° F.) enemata will relieve the irritability of the howels and contribute to recovery. They should be repeated several times daily. When such evacuations contain a great deal of sticky, viseld mucus, the addition of our per cent, of additin carbonare will hipsely the tough secretion. When there are many stools, and these complicated with tenesimis, an injection, tepid or bot, mind or may be made after every defecation, and will speedily relieve the tenesimis. In such cases flax-seed ten or thin mucilage may be substituted for water.

When the bowels are in a state of chronic catarrh or interation, the injections ought to be particularly large and contain astringent or alterant medicines. Though they be expelled immediately, mough of the dissolved or suspended remedy will remain upon the mucous membrane. Zine sulphate, alum, lead acetate, tamic acid, silver nitrate, salicylic acid, carbolic acid, and creosote have been used in such medicated injections. One-per cent, solutions will suffice. Salicylic and carbolic acids may prove uncomfortable or dangerous because of their effect on the kidners, and ought to be dispensed with. Silver nitrate requires some precaution. From half a grain to five grains or more in an omoc-of distilled water may safely be injected; but this enems must be preceded by an evacuant consisting of water only, and followed by one containing some sodium chloride for the purpose of scutralizing the nitrate and protecting the anus and external parts from local irritation. It will also be found advantageous to wash the mus and perineum with salt water before injecting the allyer solution. In many cases where one of the above-mentioned agents appeared to be tolerated bodly or proved inefficient, bismuth (or subcarbonate) subnitrate, mixed with water or with gum-acacia water in different proportions, proved very acceptable and healthful.

Suppositories are useful both for exacusting and medicinal purposes. Soap is utilized for the former purpose by the public at large,
and the same material differently mixed, with or without medicinal
additions, such as atropine, by the irregular trade. Local medicinal
applications to the rectum are best made by means of injections, but
a general effect is also obtained through a suppository. Opintos, and
narcotics generally, exhibit their full power when the suppository
is retained. Extract of hyoscyamus, from half a grain to a grain in
a suppository, to be repeated from two to five times daily, shows its
offset in relieving vesical spasm nearly as well as when taken intertually. Quinne is gradually dissolved and absorbed. Extract of nos,
both in outments and in suppositories, acts well in prolapse of the
rectum and debility of the sphincter.

Substitutions in sections of remedial agents ought to be made more frequently than appears to be customary. The extremities, particularly their lower halves, should be avoided, for their constant motion and the relative obsence of fat in their subcutaneous tissues are liable

to give rise to local irritation, swelling, or supporation. The abdominal wall or the lumbar region is preferable. The recommendation to use the interscapular space was made by famous men who worked in the laboratory and did not know what inconvenience there may be in a back, punctured and often sensitive, on which a patient is to sock his rest. A sharp and aseptic needle and gentle friction of the injected part are all that is required. The solutions used must be clear and without any solid ingredients. When they have been preserved for some time they ought to be filtered before being used, particularly when fungous growths have begun to make their appearance in the liquid. The latter may be preserved best by adding a small quantity of alcohol, salicylic acid, or hydrocyanic acid. The doses must be as small as possible, and the medicine diluted more than in the case of adults. This is mainly required when a caustic effect is to be feared. While, for instance, Lewin advised for adults a solution of four grains of hydrargyrum bichloride in an omice of water, one or one and a half grains give a more appropriate solution for infants. One or two daily doses of eight or ten drops continued for weeks will prove very useful in those argent cases of hereditary syphilis which are characterized by pempligus on the soles of the feet and the palms of the hands in the first days after birth. Brandy and ether may be used undiluted as in adults, but the latter is particularly painful and the greatest care must be taken as to the locality injected. The subcutaneous tissue must be reached and the cutis penetrated by inserting the needle at a nearly right angle from the surface. Chloral hydrate dissolves readily in two parts of water, but a solution of one in four or six is better tolerated. For the ready symptomatic treatment of convulsions it renders good service. Antipyrin is well borne in solutions of one in six or eight parts of water, camphor in from four to six. parts of sweet almond oil. The fluid extracts of digitalis and ergot are very apt to give rise to indurations and, perhaps, abscesses. As a rule, the most convenient medicaments for hypodermic administration are the very soluble alkaloids. One or three drops of Magendie's solution of morphine or the corresponding solution of morphine muriate are vastly preferable to the internal use of narcoties for had pain in pleuritis or pleuropocumonia, or in peritonitis of advanced childhood. It may be mixed with atropine sulphate for the reasons regulating its use in the adult. The latter by itself has been found quite effective in the case of an epileptic boy, who had taken the same drug internally without any success. If possible, it ought to be injected during the aura; if not, twice a day. Apomorphine muriate is a ready emetic in doses of a thirtieth or a fifteenth of a grain. Pilocarpine

muriate can be injected in doses of from one-twentieth to one-eightle of a grain. Its reckless use, both hypodermically and internally, has led to occasional mishaps, but the drug is a powerful agent for good when carefully applied, and has saved for me several cases of meningeal hypersemia and cerebral cedema, mostly of nephritic origin Strychnine sulphate, while in the same affections it has mostly proved inefficient when taken enternally, has rendered efficient services in enuresis depending on paralysis or wealness of the aphincter of the bladder and in prolapse of the rectrm and fecal incontinence resulting from paralysis of the anus which depended either on disease or congenital incompetency. In these cases a daily dose of a fortieth or a twenty-fifth of a grain-according to the age of the patient or the seventy of the case-is sufficient. More frequent doses, however, are required in the diphtheritic paralysis of the respiratory muscles, which is dangerous and apt to become fatal unless speedily relieved. A daily dose will also yield fair results, when long continued, in the later stages of spinal or cerebral paralysis, where its internal administration is entirely or well-nigh useless. Quinine salts must be neutral when injected; I prefer the browide, the muriate, or the carbamide. They, particularly the last, are among the most soluble. The carbamide dissolves readily in from four to six parts of warm water; the latter temperature ought to be preferred in every case of subcutaneous injections. Quite saturated solutions ought to be avoided, because it has happened to me that the scater of the solution was speedily absorbed, and the quinine remained as a foreign body in the subcutaneous tissue. Caffeine, in combination with sodium and salievile or bengoic acid, is an excellent heart stimulant, and has rendered splendid service in urgent cases of heart-failure or pulmonary redema depending on cardiar disease. Solio-caffeine salicylate and beuzente are soluble in two parts of water, and are readily absorbed. Both should be avoided in those cases which are complicated with cereheal teritation or sleeplessness. Fowler's sulmion, carefully filtered and diluted with at least twice as quantity of distilled water, may he injected into healthy or morbid tissues without often risking irritation and adocess. Still, I have seen a splenic abscess after such an injection in a case of surcossa of the spleen. Undoubsedly, the continued one of arsenic renders very efficient services in surrouns; but us it has to be used quite a long time, it is almost impossible, except in hospital practice, to resort to hypodermic medication. There is no farm in this, however. for a slow, gradual increase of the drug is tolerated by the stomach to such an extent that very large doses (amounting to half a drachin = two cubic centimetres) of Fowler's

solution daily, well diluted, may finally be administered after meals to children of six or eight years

Subcutaneous injections have reached an extensive field of rocfulness in scrotherapy. After it was proved that animals could be immunized against certain virulest bacteria, it was found that the blood-serums of previously immunized animals a could be utilized as powerful remedies in infectious diseases of man. In the article on diphtheria more will be said of the effect of its anticoxin, the preparation and knowledge of which is due to Aronson, Roux, and Behring. Tetanus and diphthena are certainly influenced by their proper antitoxins to a remurkable degree. Asiatic cholera is fibely to be the next great scourge of mankind to be stripped by its antitoxin (Hafikin) of part of its fury. Neither Manmorek nor others, however, have thus far succeeded in producing an antitoxin which is as effective as three of (tetamas and of) diphtheria in such infectious diseases as appear to be connected with, or dependent on streptococci-(poerperal diseases, crysipelas, scarlating, and some forms of abscesses, of angina, and of mixed (liphtheria). Nor are the claims of Coley, who, with antitoxin procured from the coccus of crysipelas and from bacillus prodigiosus, exhibits interesting results in saccomatosis (not in carcinesis), generally accepted by all. In many more diseases antiboxins have been recommended; prematurely it appears, for neither croupous pneumonia nor typhoid fever nor syphilis has been benefited thus far. Nor have the attempts at obtaining an antitoxin to take the place of calf vaccinia in the imminization against varieta been successful. Not infrequently the lymph usually employed is mixed with harberia and other impurities. The cases of tetanus appearing after vaccination should not shalle the faith in vaccination nor relax. the efforts to make vaccination compulsory, but should be a warning against careless preparation of vaccine. Thus far, however, a sterile Mood-serum of the vaccinated calf cannot be obtained in sufficient condensation and efficacy,

In organotherapeutics the hypodermic method is no longer employed extensively, since the internal administration of the different

[&]quot;Not in he mistalom for the congeninal protection afforded by the presence of "alexans" in the blood-serum of the newly-born.

Certain infections diseases have in the circulation or immunoling substance which protects as heater against reliques. This at least, is the only possible explanation of their protection. This fact suggested the providing of a paccessful treatment of meatler, presumonia, and scarlatina with the blood orms of such persons as had just passed through one of those suitables. Good results are reported. Personal experience I have none.

tissues, or their extracts, or other modes of preparations is both efficient and (mostly) palarable. Many of the secretions and tissues of the body of man and beast were used in olden times under the reign of crude empiricism or bestiality,—blood, bile, urine, faces, bair, bones, etc. Of the modern organ extracts, cerebrin, hepatin, lienin, renin, pulmonin, oophorin, spermin, didymin, the reports on which are not all dictated by an unpolluted scientific spirit, not much can be said as yet. Those which have been proven to be valuable, particularly to children, will be discussed later.

The subcutaneous injections of cocaine, according to Schleich's method of "ancesthesia by infiltration," will prove a great gain to the practitioner, imasmich as, with or without the previous use of ethyl chloride, it will facilitate many operations. Maybe its principal advantage will be in this, that many abscesses and furuncles will be dealt with before they are permitted to get larger. Their anti-neuralgic action will not be required frequently, because of the relative scarcity of neuralgias in childhood. In almost every case the solution is to consist of cocaine murane 0.1, morphine sulphate 0.02, solium chloride 0.2, distilled water 100.0 (5 to 1 to 10 to 5000).

Inhalotion is resorted to in two different ways. Either the air of the room or of a tent is impregnated with the substances to be introduced into the air-passages, or these substances are introduced through surays or atomizers of different shapes and patterns. Some of the latter have always appeared to me very faulty and not to the purpose at all. Tubes introduced into the mouth, through which substances are to be carried down, will land them in the mouth; it takes all the self-control and intelligence of an adult potient to allow the object in view to be accomplished. The oral cavity of the infant or child is small, the tongue is coiled up, and the faucial muscles will not relax. Nose and mouth must co-operate to allow inhalations to enter the larvux, or the former alone must be relied on. A suray calculated to reach the larynx of infants or children is always best introduced into and through the nose. In this way, at all events, the posterior part of the pharyex and the respiratory tract are reached to best advantage. The manner in which the spray is employed in discases of the nose and pharyux is quite often too perfunctory, with no other result but to make the patients wakeful and restive; and it should not be forgotten that no access to the trackes and bronchi is possible except iluring a deep inspiration. The difficulty of accomplishing that in children is obvious

Real inhalation, however, means filling the lungs with a gas or

vapor. Warm steam will do good service in broughitis and pneumonia, when the broughial secretion is viscid and expectoration difficult, and in diplatheria, for the purpose of softening membranes and increasing the secretion of a thin and normal mucus. Cases of fibrinous broughitis I have seen getting well in both-rooms, the hot water being burned on for days in succession and the air thick with steam. An excellent inhalation in the inflammatory conditions of the respiratory organs is that of ammonium muriate. Every bour, or at longer intervals, a gramme or more of the salt-the quantity depending in part on the size of the room-is burned on the stove or over a live coal or an alcohol-lamp. The heavy white cloud fills the room, is easily borne by both sick and well, and improves expectoration. Oil of turpentine can be utilized in a similar way. Its action is both expectorant and disinfectant. In the latter stages of pneumonia, when the broughial secretion is thick, viscid, or deficient, and expectoration and rough are wanting, the room may be filled with turpentine vapor. This can be accomplished in different ways. A large soft sponge may be soaked with turpentine, with or without the addition of some oil of sassafras, and suspended at the bedside. Or a kettle of water may be kept boiling day and night on the fireplace or over an alcohol-lamp (this is preferable to a gas-stove, which consumes too much oxygen), and a tablespoonful of turpenting, more or less, poured on the boiling water every hour or two hours. The same may be done to advantage in diphtheria, with or without a traspoonful of carbolic acid in addition to the turpentine, and in gangrene of the lungs. The inhalation of benzine, cresolin, and similar substances, and of the coal-gas of gas-works, has often been recommended in whooping-cough. In its worst forms, particularly when it is complicated with convulsions, the frequent inhalation of chloroform is sometimes life-saving. A baby of six months, with hourly attacks of convulsions. I kept alive by putting him under the influence of chloroform at the beginning of every attack, and continging that treatment for several days. Asthmatic attacks will do well sometimes with inhalations of chloroform, ether, and spiritsof turpentine in different proportions, mostly 1 to 2 to 4. Chloroform is well tolerated by the young, but should be avoided in the cases of lymplatic patients. Sudden deaths may be (and appear to have been) encountered in them, and may occur after weeks as a result of the parenchymetrons changes in the heart caused or increased by the drug-Amyl nitrite also will influence them favorably; as a preventive of epileptic attacks I have experienced occasional success with its administration. But in collapse, with paralysis of peripheral blood-

vessels, it certainly renders good service. With the inhalation of oxygen for the purpose of bridging over the most dangerous period of a suffocating pneumores and of improving tisone-change in general anamia and ill-nutrition, the profession is well acquainted. It is no use to deny that effect on theoretical grounds afforded by the alloged law of the diffusion of gases. If those who write hooks for pracprioners would but study disease at the bedside! With the inhalation of ether as an antidote to poisoning with santonin I have no personal experience. Ozone initialations have been highly recommended in anaenia, who oning-cough, and scatic fevers. We that! have to learn more of its effects, and particularly in regard to a ready and reliable method of its preparation. A. Caille, while regretting the clamsiness and expensiveness of apparatuses, uses it in chlorosis, secondary amenia, and whooping-cough. A personal communication of his speaks also of a case of tuberculosis in an adult successfully treated with come inhalations extending over several years.

In pulmonary inherculosis the inhalation of disinfectant vapors is employed less than the necessity of the cases would appear to indicate. Carbolic acid, turpentine, encalyptol have been utilized for that purpose. The object is to supply the lungs with those substances in thin dilations constantly. Prudden has proved that carbolic acid in twelve hundred parts of water stops the emigration of lencocytes in inflammatory disorders. Thus high dilutions, though they be hardly perceptible to the senses, and certainly not to a disagreeable extent, may be amply sufficient. It is for this reason that Feldhausch invented small apparatuses filled with a disinfectant substance to be persistently morn in a nostril.

The inhalation of chloroform, which is, on account of the average vigor and healthiness of their hearts, preferable to other for the purpose of producing amenthesia in the cases of infants and children, is rather unsatisfactory at the earliest age because of the superficial character of respiration. So is that of other, which, moreover, may become contraindicated in every period of life because of its detrimental effect on the kidneys and on the respiratory organs. It frequently begets nephritis, which anyway is frequent in infancy and childhood, bronchitis, and pneumonia. The effect of the amenthetic is very temporary, and the administration must be repeated and closely wanched during a convolution or an operation. The difficulty in obtaining a complete narcosis is particularly great in the newly-born. The stage of excitement is brief, the pulse becomes frequent, and the pupils contract. After a short time, however, the pulse becomes slow and the pupils dilate. The after-effects are not so inconvenient as they

often prove in the adult; infants and some children count less frequently and less produsely, and certainly with greater facility and ease than adults. They are liable to remain under the influence of the amosthetic a long time after an operation has been completed. After tracheotomies, which I never performed without chloroform unless the children were asphyziated by earbonic acid poisoning, the patients are apt to sleep long and undisturbed. Thus they require ceaseless watching until the effect has surely passed away. Through the opened traches the children will get under the influence of chloroform very easily. Five or six drops on a sponge or on some absorbent cottom, held in the mouth of the tube by means of a poir of pincers. have an almost instantaneous effect, and came near destroying-when I undertook to change the tracheal tube on the third day-a successful case of teine forty years ago, before I had the experience detailed in the previous remark. Further care is also required in regard to patients in ill health. Chronic pulmonary and heart diseases do not telerate chloroform very well, but the diagnosis of these conditions is more readily and quickly made in children than in adults. Adipose children are liable to faint. The usual operations in the mouth, such as resection of tonsils, incision of abscesses, and evulsion of adenoids. it is best to perform without an anaesthetic, for the amount required to overcome the resistance of the masseter and bucchasor is so large, generally, as to possibly endanger the life of the patients, besides the impossibility of obviating specessfully the entrance of blood intothe digestive organs, where it is inconvenient, or into the respiratory organs, where it is a positive danger.

Of the two assesthetics, ether and chloroform, the latter should as a rule, be preferred in infancy and childhood, except in a case complicated with heart disease. It is the heart that runs its risk during the use of chloroform. The average vigorous young heart is lessexposed to its tlangers, but still its power of resistance should not be relied on too long. For several reasons operations should be performed quickly, though children are assesshetized more reality than adults. For, after all, chloroform and other are not indifferent agents, and may prove destructive; the loss of a few ounces of blood is a serious matter, so long as a haby of thirty pounds has not over one and a half pounds at best; and blood-pressure is diminished so long as the operation requires the uncovering of a large part of the surface. For every operation requiring an amesthetic a saline solution should be kept ready for subcutamous injection. Among the disinfectants carbolic acid should not be used at all; even isdoform has occasionally proved dangerous;

Gargles of any description require a certain degree of training and self-control, and are therefore rarely available for children of less than seven or eight years. The liquids thus employed do not reach any farther than to the uvula, the pillars of the soft palate, and the anterior part of the tonsils. Whatever succeeds in passing them is swallowed. Thus the alleged efficacy of gargles is greatly overestimused. Astringents, however, have a certain influence in reaching beyoud the area of contact, but through their secondary effect on contignous tissue only. When a thorough effect is aimed at, it is better to rely on sprays, which may affect the whole pharyngeal cavity, or on insufflations of powders; this latter plan is rather impleasant, and should be followed in children in exceptional cases only. As, hourever, in most cases where a local effect on the pharynx is desirable the local affection spreads over the posterior narcs as well, spraying or (much better) irrigating the nose is preferable. The hymda thus employed reach the pharynx, and are either swallowed-which is often an indifferent matter-or expelled through the mouth. When these methods are undesirable,-for instance, when the liquids injected enter the Eustachian tube, - they may be poured into the masal cavities from a teospoon or a pipette. A common medicine-dropper will seldom suffice; one of the rasal cups for sale everywhere will do better. There is many a case of diphtheria in which the very gentlest method of cleansing and disinfecting the surface of the paso-pharyngeal cavity ought to be selected. More on this subject will be said in another part of this book (Chapter V.).

When no liquids are tolerated, medicated ointments may be introduced into the nostrils by means of a camel's hair brush, or poured in. Ontments prepared with vaseline, glycerin, or cold cream are good vehicles for that purpose. Spanges and brushes ought to be avoided urbanever the young patient objects to them stremously. No violence must be used for several reasons. The child's strength must not be exhausted by his attempts at self-defence, and most local affections of the throat get worse by any injury done to the epithelia. Even galvano-cauterization can and must be applied without much violence. Perseasion, patience, and cocaine will render its employment possible in many instances.

The skin in infancy and childhood participates in the anatomical structure of all the tissues at that early period, incomuch as it contains more water than in advanced age. Besides, it is thinner, and its lymphatics are more numerous, larger, and more superficial. This explains some peculiarities in regard to the effects of many medica-

ments. Hot air in apparatuses, as used by Tallerman and others, of 140° C. and more, should be watched, and lower temperatures tried first. It is employed more in chronic than in acute ailments, arthritis of all forms, deformans and generalised included, muscular and other chronic rheumatisms, and the intense chronic muscular spasm of talipes valgus (very rare in children), also the progressive ossifying myositis, and chronic osteitis and periostitis. Electricity in all its forms is sometimes efficient, and a relatively mild current may suffice. This fact is of particular importance, as, moreover, the hones also are thinner and more succulent. To act upon the brain, very mild currents only must be used. The spiral cord is less accessible, and appears to require rather large doses from large electrodes. The galvano-caustic effect resembles very much that obtained in the adult. In most cases it should be closely watched while being employed: thus, for instance, in the operation on angiomata, or diseases of the tonsils or nose, it readily destroys more than was intended.

Singuinus, when not mixed with flour, must not be permitted to remain more than a few minutes. As soon as the skin begins to be discolored they should be removed. When that is done, they may be repeated every few hours, and they are active derivants in many cases of deep-seated congestive processes. The same remark is due in reference to the use of auustand-baths. A hot mustand-bath renders good services in suppressed or insufficient cutaneous eruptions of an acute character, internal hemorrhages, meningitis, and puenmonia; but it must not be continued beyond reddening the skin; if so managed it may be repeated.

Periodories have lost much of the esteem in which they were held in former times. I remember the time when many a case of pleurisy, articular inflammation, herpes goster, was not permitted to get well without a Spenish-fly blister. Nor am I of the opinion to-day that it will do no good in some such cases, provided it be not used during the feverish stages. But their drawbocks are mony. A plaster will not stick to an emiciated and uneven surface, and is even apt to give rise to gangrene when the surface circulation is very defective. In these cases the wound will heal badly. The skin of the infant being very vulnerable, eczenia and impetigo will easily arise on ever so slight a provocation. The local pain of the application produces irritation, nervousness, and sleeplessness. This is particularly so if the application be made on the extremities or on the posterior surface of the body. The kidneys are frequently affected by cantharides, flyuria being the result in many cases, which then require energetic camphor treatment for the relief of the torturing symptoms.

There are some absolute contraindications to the external use of canthurides: the presence of diphtheria in any shape or manner, and such diseases as are liable, during the prevalence of an epidemic, to become complicated with diphtheria. Therefore, no vesicatory must be used during masal, pharyngeal, or laryngeal diphtheria (eroup), or in the different forms of pharynguis, or in laryngeal catarrh, or in erysipelas, or in diabetes.

When a plaster cannot be expected to remain on the surface and to have its full effect, cantharidal collodion may take its place. The application will prove more effective when the surface is first washed with sinegar or irritated by a sinapism, which, however, is allowed to remain a few minutes only. Then a flaxseed poultice or warm-mater applications may be applied over the vesicatory to diminish the pain and accelerate the effect. Very young infants ought not to carry a vesicatory more than an hour, at least not on the same spot. That is why to them the cambaridal collection is less adapted. The plaster may be shifted from place to place.

After the epidermis has been raised, the serum must be allowed to escape through small practures, but not so as to moisten the adjoining parts, for the canthuridin contained in the serum may exert a disagreeable local effect. The epidermis ought not to be removed, and no irritating containent used to keep up a secretion. To cover the sore surface, vaseline or cold cream is preferable to common lats, which may be, or become, rancid. The best final dressing is borated cotton and a bandage. Vaseline ointments with opium, lead, or zinc, and powders of zinc, hismath subgallate, iodoform and anylum in equal parts, or salicylic acid one part, with from thirty-five to fifty of starch, will find their occasional indications.

In many affections of the skin powders, solutions, liniments, cintments, and baths are employed. The skin is thin and irritable. Erythema will follow the contact with water quite often; thus many forms of demantitis contramidicate its frequent use. Acute and chronic cravina get on better without than with it. Therefore astringent solutions are less advisable than astringent ointments. For superficial effect these must be prepared with vaseline or cold cream, either of which may readily be combined with lead, tammin, zinc, bismuth, salicylic acid, or iodolorii. In not a few cases, on a very sore surface, demaded of its epithelium and ooding, the powders alone, or combined with starch or taleum in different proportions, will prove very effective. Ofeates ought to be avoided; they irritate the skin and produce eruptions.

As the skin is thin and succulent, and the lymph-ducts of the young

quite superficial, large, and numerous, substances will penetrate the skin quite readily. Osuments with that object in view must be prepared with animal fats, particularly with adeps base hydrosus of the United States Pharmacopesia (lanolin), to the latter of which, when tather dry, ten per cent, of scatter may be added. Still, much friction may by itself irritate the surface and give rise to suffering.

In the very young, ice and ice-stoter applications are not tolerated a long time. Ice to the cranium, the bones of which are but thin, is liable to produce collapse; about the nock and occiput it is better burne and often beneficial. Warm forwarmions and hot poultices are very beneficial in many murbed conditions of the trunk and extremities, but dangerous when applied to the head and not carefully watched tieneral buths are frequently required, local haths but seldom; doot boths may be given while the patient is lying down, but hot formulations are more readily made, and do not require the same amount of watching, not are they equally objectionable to the young patient.

Distributions were frequently resorted to scores of years ago. Modern practice has learned how to do without them, though we should be willing to assume that they were more frequently indicated than many of us believe at present. At all events, it ought to be taken into consideration that there is but a single pound of blood in a buby of twenty pounds, and that a patient rapidly reduced by sickness is least able to stand a loss of blood ever so small. Thus a venosection will hardly ever be thought of in the case of a baby; at all events, I hope never to repeat the opening of a jugular vein, practised by me on an infant taken with consulsions depending on, and adding to, corebral congestion, forty years ago. But there are cases of older children that bear, or rather flemend, a venesection. Its indications are overextension and insufficiency of the (mostly the right) heart with impeded pulmonary circulation, with intense dyspures and cyanosis, in which the largest doors of digitalis have been given in vain. In one of his cases Baginsky opened the radial arters when he did not orcered in getting blood from a vein. Such cases are occasionally pulmonary ordenta during the incipiency of the crisis in a croupous pneumonia, or, principally, old mitral incompetencies with immense dilatation and failing compensation. The objects to be accomplished are the relief of the feeble heart muscle and the restoration of its contractility. A further indication for a venescetion may be afforded in occasional cases of urarria or relampsia, similarly to its employment in the adult. Local depletions were once more frequent, though the liability of the skin to inflammation and furuncle was well understood. and the excitement of the little patient was such, now and then, as to lead to an increase of the symptoms and even to convulsions, Among the occasional drawbacks was also the possible loss of blood after the leeches had fallen off. In such a case the local use of tannie acid, alem, perchloride or subsulphate of iron, digital pressure, or in had cases the ligature underseath a hardip needle, which was inserted through the wound, were resorted to. A solution of from twenty to fifty per cent, of antipyrin in water, which may be immediately followed by a solution of tamic acid (mostly not required), is a powerful styptic. The indications for depletion were bad and poinful cases of plenrisy and peritoritis, and cerebral inflammatory diseases. In the two former, the indication to relieve pain is more readily fulfilled by ice or the subcutaneous use of morphine or cocaine. In the latter, the mastoid process and the septum narium are the points on which the leech or leeches ought to be applied. It is the latter spot which I prefer, when I have the choice, in those rare cases of brain diseases of infants and children in which I still feel justified in recommending a depletion. Altogether, however, many of the olden-times indications for bloodletting have proved deceptive. It does not serve as an antiphlogistic in all sorts of fevers and inflammations, or as an evacuum of an alleged piethora, or as a sedative and amosthetic, but it certainly may be employed to divert a local stasis, even in cases in which apoplexy is feared. In toxic conditions, particularly in intense sepsis, it should be carefully avoided, though sente poisoning may be refiered by it. Uramia, or carbon oxide poisoning, may, as I said. be benefited by a renesection, and the diminished circulating medium replaced by a saline solution administered either subcataneously or injected in the rectum or directly into a vein-

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Treatment of the Newly-Born

1. Asphyria.

This prognosis of asphyxia and of its treatment is a very doubtful one in many cases. It depends not only on the knowledge and skill of the physician, but on the causes of the abnormal condition. A moderate or serious compression of the head, compression or protager of the cord, intra-uterine respiration and aspiration of foreign bodies (anniotic liquor, meconium), apoplexy, anamia of the focus, accumulation of carbonic acid in the blood, poisoning by morphine or chloral, taken by the mother, or by her excessive temperature, congenital diseases, and malformations, each of them, or several combined, influence both the prognosis of the individual case and the result of therapeutic procedures.

When the long duration of labor, the prolapse of the ened, the protracted compression of the head, the early loss of amniotic liquor, placents practis, or a high temperature of the mother endangers the life of the fortus, the best preventive of asphysia is the artificial terminution of parturition. The resultatory organs of the focus passing out of the vagina should be protected from contact with copions discharges of liquor ammi and other foreign material accumulated in the bed, and the face be raised so that aspiration, mostly through the ness; cannot take place. The mouth of the newly-born, unless it cries limitly, must be cleansed immediately, but very gently, by a moistened piece of cloth wrapped round the finger, the tongue drawn forward, and the baby placed on its side before attention in paid to anything else. Beating the nates, tickling of the fances by means of the feather of a hen or a givee, and the momentary inhalation of ammonia can be resorted to before the baby is separated from the placenta. Most practitioners, indeed, will, under the usual circumstances, prefer to persong the connection with the maternal organ until the pulsation of the cord begins to flag. The separation of the baby must take place immediately when there is no pulsation in the cord or when asphyxia is well pronounced. When the haby is strong and evanosis marked. Gresser recommended as allow the cord to bleed before the application of the ligature. When bleeding was scanty.

6 8

he increased it by placing the buby in a warm both. This procedure I have imitated several times with advantage.

When the ligature has been applied and the haby removed, the mouth of the asphyetic infant ought to be cleansed again as above, quickly but gently. For amniotic liquor, meconium, and vaginal secretion, when aspirated, will, though the asphyetic condition may be relieved, give rise to bronchitis and pneumonia after two or four days. Many babies the in this way.

Insuffiction into the lungs for the purpose of establishing respiration was practised by Smellie as early as 176x. It is done from mouth to mouth, from mouth to nose, or through a catheter introduced into the larynx. The first method is not reliable, for the torque is liable to close both pharynx and larynx; the second is often successful, but may inflate the stomach as well as the lungs. By inflating the former the chances for a normal action of the lungs become less. After every insuffation which fills the lungs, the chest ought to be compressed by two hands over the lower latero-anterior region of the chest-walls to facilitate expiration.

The direct insufflation of the Imags may become detrimental for several reasons. H. Reich relates the case of a consumptive midwife who was reported to have injected twelve infants with acute tuberculosis in thirteen months. In the practice of another midwife, who was healthy, in the same town, no such case occurred. During nine previous years there were but two cases of tubercular meningitis, and but one in the year following the death of the consumptive woman-Moreover, the act of insufflation may prove dangerous by the impossibility of limiting the force of the entering volume of gas. Rupture of pulmonary tissue and emphysema and pneumothorax have been observed. The same accident may occur when a catheter is used for the same purpose. It has, however, the advantage of permitting the sucking out of the aspirated material before air is blown into the lungs. Ribemont's and other metal catheters cannot be carried much below the vocal cords. An elastic catheter, guided by a wire which allows any degree of bending and may be withdrawn when the vocal cords have been passed, is better adapted both for aspiration and inflation.

The asphyetic baby ought to be plunged into a warm bath (son* F.) immediately and gently rubbed. The other methods may be continued during that time,—beating, tickling, electricity. When it is thin, pale, and collapsed, a bot injection into the bowels (from 104* to 115" F.) will render good service. The quick and repeated alternation between the warm bath of a minute and a cold one of one or

two seconds, or the pouring of cold water on chest or neck while the body is in the warm bath, restores many; but great care must be taken lest the latter be too hot. It may produce cloric or tonic contubions, and has been reported as giving rise to tetanus. Before and after the bath, indeed at any time, the vigorous swinging of the taby on the arms of the medical mun is a good adjuvant.

Among all the mechanical methods of artificial respiration (Marshall Hall, Silvester, Howard, B. Schultze, Pacini, Wohler, Bani, Schüller, Dew, and others) those of Silvester and Schultze render the best services in the asphyxia of the newly-born. Both are very simple, and either of them is effective. A. Brothers prefers the former ("Infantile Mortality during Childhirth and its Prevention," Philadelphia, 1896).

Silvester places the patient on his back, a small pillow (piece of clothing, towel, sheet) between the shoulders, the tongue drawn forward. The two arms are caught above the elbow and while being ererted are slowly carried upward. Thus the chest is expended. Then they are carried downward and pressed against the sides of the chest, a little anteriorly to the axillary line. Thus the lungs are compressed. This combined action may be repeated fifteen or twenty times in a minute, and a hot both given afterwards. Then the procedure is renewed.

B. Schultze places his index-fingers in the axillae, the three other fingers gently against the sides of the chest, the thumbs covering the shoulder from behind. The infant is then awang forward. The lower extremities bend on the abdomen, the abdomen presses against the diaphragm, and the lungs are compressed,-expiration. The parts then return slowly downward and swing back, thus expanding the chest,-inspiration. This action may also be repeated fifteen or twenty times in a minute. After each minute's swinging the haby is placed in a warm bath. There is but one (occasional) contraindication to the employment of this method,-viz., the insufficient development of the foetal bones. When the newly-horn is too premature and the ribs too soft and flexible, it is uncless. It is also contraindicated in the plethoric, congestive variety of asphyxia. That proper caution should be exercised is self-understood. In a case published in the London Lancet of May 8, 1847, the infraspinatus and teres minor muscles were injured so as to cause rotation and adduction of one ann.

During all this time, whenever feasible, the surface of the infant must be kept warm artificially by hot blankets, stones, bottles, and a few drops of brandy, whiskey, camphor-water, or fincture of musk, or a drop of tincture of helladoma may be given in some hot water if deglinition is possible, or a larger quantity (some ounces) of hot water (from 104° to 115° F.) injected into the rectum. When the main difficulty appears to be, after a while, in the excessive debility of the heart, with absence of the radial pulse, a five-hundredth part of a grain of nitroglycenn, repeated after fifteen and thirty minutes, may render good and speedy service through its ready absorbability on every mucous membrane. I have no experience with it in the asphysica of the newly-horn, but its rapid action in failing beart and collapse and shock from other causes memorages me to recommend it for a fair trial of its powers.

Laborde was very successful by drawing the tongue of the asphyctic baby forward in rhythmical alternations. That procedure is to be repeated ten or fifteen times a minute. It does not seem to be promising unless the reflex irritability (small in the normal new-born) of the medulla oblongata is rather intact.

Electricity was recommended in cases of asphysia as early an 1793 by Hufeland. But the first case in which the rhythmical faradization of the phrenic nerve and its associates was resorted to (Ziemssen) for the purpose of producing artificial respiration was that of an asphyctic girl poisoned by carbon usade. The phrenic nerve acts on the diaphragm. Its aids are the cervical plexus, which controls the trapezous, levator scapule, and middle scalenus muscles, and the brachial plexus. The ramifications of the latter are the anterior thoracic nerve for the pectoralis major and minor; the posterior thoracic for the middle scalenus, posterior superior serratus, and the rhomboid muscles; and the burnal thoracic for the serratus antiens major.

In many cases since, such as poisoning by chloroform, coal-gas, opium, diphtheria, hydrogen sulphide, and permicious intermintent fever, also in those of apoplexy, drowning, and hanging, electricity has been employed to advantage. Its effect is often rapid and powerful.

In asphyxia of the newly-born, the systematic faradization of the phrenic nerve was first employed by Lauth and Persice.

The point of application selected by most authors is near the stemo-cleids-mustoid muscle, over the phrenic nerve. The other pole is applied either to the neck or to the diaphragmatic region or any other part of the surface. The localization of the effect to the phrenic serve alone, which was insisted upon by many, is certainly an illusion. The current will surely strike the pneumogastric, phrenic, sympathetic, and many sensitive and motory nerves at the same time. As this

cannot be avoided, as indeed it is better that it should be exactly so. it is best to use large snorge electrodes and moistes them thoroughly with salt water. The head, arms, and shoulders should be slightly raised, and a small pillow placed between the shoulders for the asphyctic baby to rest on. One of the electrodes must be lent stationary. the other brought into contact with the surface a single moment only. A deep inspiration will then take place, the longs will expand, and lateral pressure on the lower part of the circst should be resorted to for the purpose of emptying the lungs afterwards. Another application is then made with the same result, and must be followed by the same manipulation. This less to be continued for some time mult the bally cries, and until it appears safe to discontinue the application. Whenever a cough or a coughing movement is noticed, it should be omitted temporarily. The invorable result, however, is not always. permanent. The causes of the asphyctic conditions are still active. and the infant will require resuscitation again, and perhaps many times. Thus close attention must be paid, sometimes for hours,

Great care should be taken in regard to the duration of the application. Continued or too frequent irritation by the current causes over-irritation and paralysis. Not infrequently the immediate effect is a favorable one, inspiration becoming sleep and the heart active, but after a short time the former grows more superficial, the pulse feeble, and the example has returns to the lips and inger-mails. Then it is time to stop for a while, and resort temporarily to other means of resuscitation. Thus the practice of Lauth, who applied the current persistently for two or three minutes, is decidedly improper and dangerous.

In some cases, where the interrupted current is inefficient, the galvanic (continuous) current, with occasional reversions, has been known to yield better results. In my own cases I have never had an opportunity or been under the accessity of employing it.

The application of large sponge electrodes may not always be convenient. In those cases no larm is done by using the metal poles instead. Though the irritability of the brain (and nerves) is loss in the newly-born, the pain produced by the interrupted current thus applied is very intense, and the effect on the contraction of the diaphragus quite marked. Thus it is not necessary to lose time in preparing, if it be not on hand, the more complicated apparatus. Still, exhaustion is more readily obtained through resuscitating by pain and muscular action combined than by muscular contraction alone. In most cases, however, I was satisfied with not losing even a fraction of a minute, particularly in those early times, when

the most convenient appointus was the obl-fashioned rotating machine.

How long is the asphyetic haby to be watched and the attempts at resuscitation to be renewed? At all events, they must not be given up to long as the heart-beats are middle, though ever so feelily. Nor is a single scream sufficient to permit watchfulness to be relaxed. The deep recession, during inspiration, of the disphragmatic region (the "peripulmonary groove" of Trousseau) should have coased, the cry be vigorous, the eyes wide awake, and the extremities in lively motion. Before this is accomplished there is danger of a relayed, partly from impoired inservation and the continuation of some of the causes of asphysia, and partly from obstruction through mucus which may be coming up constantly and gather in the pharmy and posterior mares.

Some cases of asphysia are particularly troublesome: these in which it is due to prematurity of the newly-born or to an actual anatomical change (hemorrhage, compression of the brain or medulla) which requires time to get well or will terminate fatally; also those which are due to congenital anomalies of the organs of circulation or respiration (syphilis of the lungs, effusion into the plenral or the peritonsal cavary, thoracic tumors, etc.).

There is no more trying loar in the life of the practitioner than that spent on resoscitating an asphyetic newly-horn. Every moment tells. For it is on the immediate restoration to full life that will depend the narrow horder line between a physically and intellectually normal human being and an appleptic, paralytic, or idiotic invalid. That is why I placed asphysica at the head of this chapter and emphasized its many dangers and possible narroes of relief.

2. Postuatel Asphysia and Atelectoris.

At lectuses may be congenital or acquired. The lungs may never have expanded to their normal degree, or after expansion had taken place, they may have collapsed or contracted again. The causes of this condition may also be either congenital or acquired. There may be malformations and intra-interine diseases of the organs of respiration or circulation, such as defective development of the lungs, berma of the diaphragm, hypertrophy of the thyroid gland, pleural effusions, syphiloma of the lungs, acquired bronchial catairth, bronchitis, and pneumonia. Or anomalies of the nervous system may exist, such as homorrhage or some other injury of the respiratory centre, and cerebral pressure from effusion, besides intra-interine malformations. Or,

finally, the haby may be premature, with feeble muscles and soft bones.

The treatment resembles much, or is identical with, that of genuine asphyxia. Respiration must be insisted upon. Warm and cold
haths, cold affusions in the warm hath, swinging, bearing, and electricity each come in for their share in the treatment. The baby must
be made to cry, or it will perish. This indication is particularly urgent
in the acquired cases of atelectasis which result from brouchitis.
There the small brouchial tubes are filled with a viscid sticky mucus,
which must be removed. This is a condition not peculiar to the quite
young only; it is as well met with in older babies suffering from
brouchitis, particularly when in a condition of ill-nutrition and general
debility. In them, the closing of the nose and month for from four
to eight seconds will so saturate the respiratory centre with carbonic
acid as to elicit deep and forcible inspiration through irritation of
the medulla. It is an effective method, and not cruel because it is
successful.

The babies should be fed conscientionaly. (See Chapter I.) As many are suffering from inaution, this requires close attention. They should have plenty of water, warm or hot, with from one to four drachnes of brandy through the twenty-four hours, aqua campbora, a few drachnes; perhaps, as suggested above, nitroglycerin. Hot injections of saline solution into the rectum will stimulate the nerves and fill the blood-vessels. The infant must be carried about, its position in bed changed from time to time, and its skin kept warm according to the methods detailed above. Even the most desperate-looking cases, with shallow respiration and cyanosis of the skin and tracous membranes, may recover when the attendants are as persistent as the morbid condition is dangerous.

3. Immaturity and Premuturity:

Immuture (born before the twenty-eighth week) and prenature boliss (born between the twenty-eighth and thirty-eighth weeks) require a great deal of care, the more so as their condition may be connected with a low state of the mother's nutrition or with an inherited (lness (syphilis)). Those which are not really diseased, but merely undeveloped, with low weight, wrinkled, covered with lanugo, eyanotic, sometimes exhibiting scleroms, thround the most scrapulous hygiene and diet. It is in this condition that Credé's, Winckel's, and Tarnier's apparatuses (contynue) have triumphed over great difficulties. The apparatus of De, L. Emmett Holt is simple, practical, and inexpensive. A large metal incubator, devised by Mr. John P. Patnam and Dr.

Rotch, of Boston, in which the baby lies upon a water-bath and is heated by graduation from all soles, was described by Dr. H. D. Chapin in Archives of Pediatrics, May, 1807. Still, any hox or hed, with hot bottles and stones, or a box with double walls filled in with but sand. or a bed with not flannel or cotton, or carefully exposed to the hot register, or anything the good-will and ingensity of the practitioner may supply, will answer the purpose. At the same time the air admitted to the lungs should be moderate (50° F.) and pure, the vernilation of the room should be indirect, there must be no draught, the washing-with warm water, no bathing-should be done quickly, and the skin dried with the softest of materials. Any carelessness may lead to asphyxia, atricctasis, and sepsis. This may enter through any sore on the integrament or through the umbilious; for in this condition the coul is more liable to rot than to mummify. Besides, there is usually a large quantity of uric acid milarction, with the tendency to retention of urine and uramia. That is why as large a quantity of water is required as can safely be introduced. Altogether, feeding is difficult, no sucking is possible, the teaspoon or a medicine-dropper should be employed at short intervals. Besides peptonized milk and water (1 to 8 or 10), segur-water, moderate stimulants, a few drops of whiskey in water hourly, and warm saline enemata should be given Gradual changes will suggest themselves to the medical attendant.

In this way, of babies weighing from one thousand to fifteen hundred grammes fifty per cent, of those weighing from fifteen hundred to twenty-five hundred grammes from seventy to ninety per cent, have been saved. D'Outrepout saved a newly-born of thirpen inches in length and one and a half pounds in weight, Kopp one of eleven inches and two pounds. Redman one of thirteen inches and a pound and three and a half cunces, Ahlfeld one that was burn in the twenty-ninth week of utero-gestation, measured fifteen inches (thirty-time and a half centimetres), and learned how to suck after a few weeks; and another one of the same size and a weight of forty-eight centers (fourteen hundred and fifty grammes) when five weeks old it also took the breast afterwards. Several infants of less than three pounds at hirth I have saved myself, nor are similar cases very rare in the literature of the subject.

J. M. Moore published in the Philadelphia Reporter of April 17, 1880, the case of a fortus born before the end of the sixth month of utero-gestation—length nine inches, weight one and a half pounds—that cried after thirty minutes, but did not move. Friteen months afterwards the same "fortus" is said to have commenced to walk, and to have uneighed nineteen pounds.

4 Kephalhermatonu.

The hemorrhage between (mostly) the parietal, rarely the occipital, and still more rarely the frontal bone and its pericranisms is usually the result of pressure by the lower segment of the interns. not always during protracted labor, or by the forceps, for occasionally kephalhiematoma is observed after breech presentation also. Predisposition is caused by the deficient development of the external layer of the cranial bones and the shallowness of the indentations in which the blood-vessels are running, the thinness of the vessels, and the mobility of the integument, caused by the loose and vascular structure of the connective tissue of the pericranium. It is circumscribed, does not spread beyond a suture, fluctuates, and begins, after a few days, to be surrounded by an osseous ring, the result of the formation of new hone from the raised periosteum. It grows in size for some days, then remains stationary, and is absorbed within from six to twenty weeks. After this time the bone is thickened, but absorption of the newly formed ossesus tissue will take place in most metances. In exceptional cases only a permanent thickening will be noticed in later life.

In some cases there is an internal kephalharmatoma as well. It consists in bleeding between dura mater and cranium, and may lead to all the consequences of intracranial hemorrhage (apoplexy of the newly-born),—viz., convulsions, paralysis, death, or meningitis, cystic degeneration, etc. There may be no contiguity between the external and the internal hamatoma. Still, many cases of the external form will extend directly into the cranial cavity through a congenital (transmatic) finsure in the hone.

The treatment is forestalled by what has been said of the spontaneous absorption of the extravasation. No treatment is required, The swelling must be left alone. The bony thickening will also get well in the course of time. It is important to insist upon this expectant treatment, because the attendants will often not appreciate the absolutely benign nature of the large tumor.

Meddlesome practitioners have tried compression. If there he any communication with the cranial cavity, this procedure may become dangerous by blood being forced into the interior. Ontonents have been recommended "to make believe," for the purpose of quieting the anxiety of the family. Puncture has been resorted to. If made at an early period, it will facilitate new blooding; in many a case it has been known to produce suppuration, though the operation was believed to have been asoptic. Incision is still more reprehensible.

It is not permissible except in those cases which have terminated in supparation through previous maltreatment or septic infection. Then a large incision and thorough disinfection are indicated, and will be followed by relief from pain, redness, and fever. Functure, aspiration, or incision may perhaps be necessary, even without supparation, in one of two conditions: first, the tumor may be so large as not to undergo absorption for many weeks, and so endanger the bone, which may become necrotic; still, I have not seen such a case these twenty years; secondly, in a case of complication with apoplexy, aspiration may be capable of allowing some of the internal extravasation to escape.

Other indications for the treatment of this internal kephallucrutions are suggested by asphyxia or other symptoms which depend on disturbed innervation. The antiphlogistic treatment will be confined to cold or cool applications only. The consecutive paralysis demands an appropriate treatment, the results of which will be mostly questionable, and depend upon the amount of extravasated blood, of tissue distroyed or compressed, and consecutive changes in the nerve-centres. Surgical interference, particularly when there is depression of horewas recommended by Jenkins, who reported a successful case. When there are positive symptoms of compression of the brain, it is safe to presume that the internal humatoma corresponds in its location with the external one. A fatal prognosis would justify surgical interference.

5. Humatoma of the Sterno-Cleido-Marisid Muscle.

The fragility of the fortal blood-vessels and an injury experienced by the muscle during particition give rise to a bemorrhage about or above, seldom below, the middle part of the long muscle. When observed, the tumor has the size of a hazel-net or larger; it is spherical, circumscribed, and rather hard. The latter condition is due to the secondary inflammation of the turn muscular fibres. This occurrence is not very uncommon. Even in older children, mainly in kitedying boys, who suddenly strain either of their sterns-eleido-mustoid muscles, the same benutoms and mytoritis are observed.

When observed at an early period the local application of ice may reduce the bleeding, though the blood of the newly-born is not congulable like that of more advanced age. For a week, after ceasing the employment of ice, small pieces of cloth moistened with rold water will check the secondary inflammation to a certain extent. Very gentle massage should be employed after the disappearance of the severe pain of acute inflammation. During all this time the head most be kept immovable,—best perhaps by carrying the haby on a fair pillow large enough to support the whole body, head included. When the tumor has time to become hard, it may last for years; when it is large, it may give rise to torticollis. Then gentle stretching and massage, the application of a mild galvanic current, and the immetion of an absorbable ointment of potassium iodide may be tried to advantage (iodid, potass, aq. 33 %; adep. 2; adep. lance hydros, 6 to 8). If torticollis ensue in later life, surgical treatment will be required (not necessarily the knife).

6. Scierena.

The induration of the connective tissue of the newly-born known by that name consists of a serous infiltration of, and under, the skin, also of the muscles, begins generally in the lower extremities, and spreads over the whole body with (mostly) the exception of the chest. The surface is apt to be slightly hypersemic in the beginning, and then turns yellowish and quite pale. Respiration is shallow, pursing feeble, secretion of meconium and urine scanty, sensibility eminished, the pulse slow (60 to 75), accelerated only towards the fatal end, and temperature reduced much below the normal, even to 90° F. and less. Recovery very rarely takes place. Even those who suffer from a slight attack only are liable to perish of prommonia or of nephritis after two-or three weeks. Many of the infants are prenaturely born, exhibit defective innervation, possibly resulting from fortal brain disease, or suffer from some cardiac affection, myocarditis or other. No infectious invasion can be traced as yet. The fat of the newly-born contains only 43.3 per cent, of oleic acid compared with that of the end of the first year and later, when it has sucty-five per cent. The badly nourished infant has still less cleic acid than mentioned, and in them the peculiar stiffness of the body, mostly beginning in the calves of the legs (there is more offic acid in the fat round the os calcis), depends on that condition of their fat-

The patient must be fed from a spoon or dropper and by the rectum. Feeding is, however, very difficult. Food should be warm, rectal injections hot. Alcoholic stimulants may be given in the shape of brandy or whiskey, four or six drops every half-hour; also a drop of fineture of digitalis every hour or two hours, and aqua camphorae, ten drops every hour. Massage with oil or landles, commencing at the periphery, gentle but persistent with the thoroughly warmed hand or through a warmed cloth, will improve circulation and probably, to a certain extent, absorption. Maybe, also, possive movements, practised gently but persistently, and extensive (general) galvanira-

tion of the surface will serve the same purpose. The infant ment be kept warm near a score or furnace register, provided the head can be kept away from it and the air-supply for the lungs be kept up at a moderate temperature. Otherwise hot stones, hot sand, hot bottles must be distributed, well covered, through the bed at a safe distance. Frequent bathing in salt water of at least too. F., with constant friction and massage in the bath, will prove as beneficial as the bad or very doubtful prognosis will permit.

7. Bathing.

The first both of the newly-born, and bothing of infants in general, demand great caution; for the temperature of the young has its peculiarities. After having been higher in the forms while in the merus than that of the mother, it is upt to lose a degree (F) or more, immediately after birth, in consequence of defective circulation and respiration and of the great difference in the haby's surrounding before and after birth. A feeble new-born requires more time before its temperature rises again to a normal standard. That is particularly so in regard to the slein. Thus it is that the thermometric measurements when made in the axilla are as deceptive in the feeble young as they are apt to be in adipose adults, with their insufficient superficial circulation.

To a certain degree the cool air of the room has a tendency to reduce the surface temperature of the newly-born. When moderate, the sudden change acts favorably by inciting reflex action, but a considerable and continued reduction of temperature must have a dangerous influence at a time when the functions of the body are not yet regulated.

In Lassar's experiments," when an animal, after recovering from albuminum, was exposed to a cold temperature, the same condition returned. Rabbits thus exposed, without or after depilation, suffered from interstitial inflammations of the liver, the lungs, the heart, and the neuroglin. The blood-vessels of the liver and the lungs became enormously dilated, the arteries filled with thrombotic masses, and bescover emigration was marked round the smallest veins. When

[&]quot;Virchow's Arch. set laxis. A large amount of literature on the same subject has been since collected by Reinsboth in vol. Inii of Deutsche Archie & John Med. (868). By endden cooling he carried suggillations of the plears, also desintegration of the blood (harmoglobinstra), thereby irritation of the vascmotor centre, with hursting of the finest plearal and primounty blood-vessels, though them was no reason to assume a greater fragility on the part of the blood-vessel walls.

the animal was pregnant, even the liver and other organs of the fartus were found to be inflamed. This is exactly what clinical experience has taught every observer of every generation, in spite of modern contradiction. Thus I have observed a suddon return of the morbid symptoms in a number of persistent and protracted cases of hieroglobinuria after every exposure to cold, and particularly to cold and moist air.

Therefore the newly-born habe should not remain uncovered for any length of time. The surses who spend—with more pedantry, emphasis, and self-consciousness than imelligence—much tuniccosary time in oiling and scaping and washing and bathing, turning this and that way, drying the surface, wrapping the navel, applying the burdage, and dressing the newly-born in fineries, in which it finally returns to its mother's bed or to its crib shirering with a cold nose and blue feet, are not infrequently the causes of ill health or death. In a case recently seen, the pneumonia of the newly-born was undoubtedly due to the fact that the buby was neglected while both physirian and nurse were engaged about the fainting mother. Craig must have seen many such cases, for with him "no buby is ever washed, dressed, fed, tied up, the cord is not wrapped up, but the infant is anciented with fat and wrapped in flaunch the first twenty-four or thirty-six hours." Similar advice has been given repeatedly.

The bath of the newly-horn must not be lost. A single midwife in Elbing lost ninety-nine bables out of three hundred and eighty, of trismus. Through all her life she had estimated the temperature of the bath by trying it with her uncovered anu. She lost her temperature sense after a while, as was found by a judicial investigation, and the bables their lives. Still, the bath ought not to be less than 90° F, nor ought it to be much cooler through a number of months, in spite of a French anthor's opinion, who says that the epidermis becomes macerated by warm baths; that bables who are bathed grow "pale, soft, and flabby and eczematous," and proves the correctness of his position by his zoological discovery that "no other mammalia take a warm bath regularly."

^{*}To the general rule implied in the above remarks on the necessity of buthing in warm water only, according to which the body of the newly-born infant is to be kept warm, the head forms an exception. Artificial heat and feather pillows ought to be avoided. A soft heir pillow is perferable, or a quit fined with a layer of cotton. Whenever it is necessary to employ a toth head-nest, a feather pillow may be covered by a hed-sheet folded to the size of the pillow and finitened to its corners by safety-pins. Air-custions sught to be in state common use than they are.

The proportion of the surface to the cubic mass of the human body is larger in an infant than in an adult, and the number of peripheral nerve-ends and capillaries relatively larger. Thus, there is a greater liability to reflex symptoms depending on exposure, in spite of the low degree of nervous irritability in the newly-born during the first few weeks. That is why a protracted cold bath is not well tolerated even by older infants; but, also, why tepid or cold bathing or packing exhibits a very much more rapid effect in the young than in the old. For both the reduction of temperature and the reflex effect do not depend on the weight of the body, but on the extent of the conducting and radiating surface.

While the cord is drying, and until it has fallen off, it is better not to hathe the newly-born again after its first bath. Washing may take its place, for it is best not to interfere with the normal drying process.

When the baby is six months old, particularly during the summer months, the warm bath is to be succeeded by washing and friction with tepid and, later on, with rold water. When washing is substituted for bathing, water may be selected of a lower temperature, inasmuch as but a part of the surface is exposed to its influence at one time. When the loth, in the course of time, is gradually made cooler, friction of the skin during bathing stimulates its action. In pathological conditions, when cool or cold bathing is resorted to for the purpose of reducing an abnormal temperature, this aim is always and easily reached so far as the surface is concerned; but, to accomplish the same end for the whole body, it is necessary that the skin should retain its vitality and lively circulation. Unless that be so, the internal temperature may remain unchanged or even rise while the surface is cool. In such a case, which must be ascertained by taking the rectal temperature, the cold bath ought to be followed immediately by a hot one for the purpose of restoring the surface circulation. In this way the reduction of temperature sized at by the administration of a cold bath may finally be accomplished by hot water. In less orgent cases the warming of the extremities and of the general surface by dry heat may suffice to restore the warmth of the surface. At all events, a cool or cold bath, after which the feet do not become narm at once, is dangerous.

8. Marrino. Maxiitis. Perimutitis. Angioma.

Since the time of Menard, Scanzoni, and Guillot, the secretion of the mammary gland of the newly-born has been the subject of frequent investigations by clinicians, chemists, and physiologists." It is mostly found towards the end of the first week, and resembles very much the milk of the mature woman in the manuse both of the male and female infant. The superficial milk-ducts are obstructed with epithelium: the interior ones are dilated in many places and filled with a cuboid epithelium and a liquid which resembles color-trum. This secretion may be absent, but it is frequently found in premature or still-births, though the manuse be but rudimentary. The dilatations will increase in size for weeks, and begin a retrograde development as late as the middle of the first year of life.

The tendency to epithelial elimination, which is a peculiar feature in the newly-horn, and which is so commonly observed on its skin, mucous membranes, and in schocoous follicles and kidneys, appears to be very marked in the mamma of the newly-horn. This discovery of Epstein renders the subject of our discussion very much clearer from an etiological point of view.

The swelling and secretion of the gland may last a week or two when undisturbed. After it has been squeezed out ever so gently, a new secretion will follow and continue five or six weeks. Thus pressure of any kind should be avoided. It is barely possible that it is not always injurious, and that a gentle inunction of warm oil. which is so commonly used, may do no lurm. But, as a rule, every sort of pressure occasions an attack of inflammation and, maybe, suppuration. Though an abscess be ever so small, it is sufficient to destroy forever all or a part of the mamma.-a serious misfortune in a female. A swelled mamma must be left alone. Applications of cool or warm water, the cloth being well pressed out and owered with oil-silk and cotton or flannel, or of a mild lead wash, will answer well. Also applications of potassium iodide dissolved in glycerin, one part of the former in two or five of the latter, which are repeated every few hours. Extract of belladoura may be added to advantage. When supportation cannot be avoided, the incision must not be delayed. It ought to be made at the greatest possible distance from the nipple. directed towards the nipple, so as not to cut the main milk-thets. and treated antiseptically. Indurations remaining behind require frequent and gentle inunctions of an icoloform ointment (icoloform, Lo; ol. bergamot, 2 drops; adep., 6.0 to 8.0), or iodoform collections to be applied with a brush twice every day (iodof, 11 collod., 10 to 30) in such a manner that only those scales of the application

[&]quot;Jacobi, in Gerlands's Handle d. Kinderkrunkle, 191 rel, 2d part, p. 30 of the 2d ed., 1882.

which are peeiing off from the skin are removed before a new layer is applied over the dried-up previous application. No collishion should be employed so long as there is the slightest secretion from the surface or from a wound. In place of the iodoform, potassium iodide may be used. A very mild galvanic current of from two to six small elements, conducted through the induration by means of soft sponge electrodes moistened with salt water, has rendered me good service in many cases.

Perunastitis, the inflammation of the surrounding connective tissue, may occur primarily, but is mostly the final result of transmite mantitis. It is liable to grow danperous, unless incisoons be made early
and treated antiseptically with great care. I have not with not a
few cases in which the suppuration of the connective tissue was very
extensive, spread over a large surface, undermined the skin of the
chest, axiila, and back, resulted in gangrene, erystpelus, or sepsis, and
terminated fatally. Antiseptic solutions (applications, injections, irrigations) must be used frequently, but ought to be mild. Carbolic
acid should be avoided, for infants are easily poisoned by it.

The mamma ought to be examined for angiomata in every buby, whether there be mustitts or not. Nævi are he no means rare in this neighborhood, and ought to be destroyed at once, either by the application of furning nitric acid when superficial or by the actual cautery (red-hot iron, galvano-cautery, or thermo-cautery) when they are deep-scated or form geneine vascular tensors, for they are liable to grow rapidly and prove dangerous to the female.

9. Treatment of the Cord.

The indirations for the application of the ligature, and therein the complete interruption of foetal circulation, appear to vary in the practice and teachings of obstetricians. When the buly has cried a few times, the majority apply the ligature and cut the cord. Others insist upon waiting for the collapse of the cord produced by that of the vein, while the arteries are still pulsating, and some will wait for the disappearance of the arterial pulse. A few facts should be remembered for the purpose of guiding the practitioner in individual cases, for the amount of blood entering, or retained in, the body of the infant is by no means an indifferent matter.

If the ligature be applied after the consistent of the umbilical pulsation, there are still six ounces of blood (one hundred and ninetytwo grammes, according to Zweifel) in the placents. If the latter be compressed by Credé's procedure, that amount is reduced to three ounces (ninety-two grammes). Thus the difference between the two procedures means a difference of three ounces of blood in the circulation of the newly-born. That is an enormous addition to the usual quantity of blood, which in the infant slightly older is but little more than five per cent, of the total weight of its body. After all, it appears that a delay of the separation of the baby, when poorly developed and pale, and the offmission of more blood to its circulation, are deserving of recommendation; while, on the other hand, there may be an occasional indication for bleeding the infant."

The admission of a large quantity of blood, however, is no unmitigated blessing. The blood-vessels of the newly-born are so thin and fragile that spontaneous hemorrhages on serous membranes and into the nerve-centres, etc., are by no means uncommon under normal circumstances. It is true that the destruction of superfluous bloodcorpuscles is very rapid,-as rapid, indeed, as it is known to be after transfusion in the adult,-but some time is required to accomplish that end, and during that time benorrhages may take place, and have been reported by Neumann and Illing and observed by me. This danger is sufficiently great to counterbalance the alleged observation of Hofmeler, according to whom habies, after deferred separation from the mother, lost less weight and commenced to increase sooner than those removed more speedily. However, Violet states that the former lost twenty ounces (six hundred and nineteen grammes), the latter but nineteen (five hundred and eighty-five grammes)-not much of a difference, though,

Nor does Pecak's observation, according to which congested habies exhibit a more intense degree of jaundice, lack confirmation.

If the ligature be thin, it is liable to cut through the walls of the blood-vessels prematurely; if too thick, it may not suffice to compress them satisfactorily. It ought to be applied at a distance of from one and a half to two and a half inches from the abdominal wall (three to five centimetres); not nearer, in order to avoid the effect of the great muscular power of the umbilical arteries inside the abdominal cavity. A second ligature is placed about an inch from the first, and the cord cut between them. It is a good rule, which trest surely be adhered to in every case of thick cord, to apply an additional ligature between the first and the abdominal wall, to avoid hemorylage which may take place after the cord has commenced to shrink, from the insufficiently compressed arteries. The abdominal end of the cord is then wrapped up in a dry and soft piece of linen, list, or borated cotton, placed on the left side of the abdomen, and

fastened, by means of a soft flannel bandage, which is wide enough to cover the larger part of the chest and all of the abdomen, so as not to slip.

In wrapping up the end of the cord no oil or fat should be used. Warrith and dryness favor munimification; moisture and exclusion of air, gaugerne. This holds good also for the cord when it is separated from the fixing haby by an additional ligature, and in the dead. Thus, the former forensic axiom, which prevailed for decades after Meckel had demonstrated its falliety as early as (853, that a dry cord proved that the baby had lived, is also littly worthless. Fatty substances and moisture of any kind must be avoided. That is why it is best to omit the daily hath. Powdered bismuth subgallate, or sinc oxide, or indoform, or salicylic acid (one part with forty or twenty parts of starch) may be dusted round the insertion of the cord and over the stump daily. The latter application is not necessarily useless (from the point of view of antisepsis), for the separation of the cord is a gradual one, and not uniform through the whole thickness of the ammion and the three blood vessels.

The size of the sore stump and the rapidity or slowness of cicatrization depend upon the thickness of the cord, the intensity of the line of demarcation, and the reactive inflammation. The latter are most marked in vigorous infants. As a rule, the surface is dry a few days after the falling of the cord, and cicatrization complete within twelve or fifteen days after birth. This normal process is, busever, disturbed by careless handling, local irritation, and infectious influences. In these imfavorable cases there is a serous or purulent secretion, and cicatrization may be deferred for many works. Under these circumstances local treatment is required. Carbolic acid ought to be avoided, for the newly-born and ladant are easily influenced by its poisonous properties. Solutions of lead, zinc, or alum answer quite as well as any solutions do. As I said, however, it is best to avoid water. I recommend the powders of zinc oxide, hismath subgallate, alms with starch, salievic acid with starch, or iodoform Such measures will always prove helpful; to omit them in times of prevailing crysipelas or diphtheria is unpurdomble. Perchloride of iron or subsulphate of iron must not be used. Under the hard coagulation formed by their application over the whole wound secretions will accumulate, cannot escape, are absorbed, and produce sepsi-I have seen babies die from applications of iron to the umbilical stump, as I know of women dving for the same reason when the hemorrhages from their uteri or from the lacerated vaging were maltreated in the same manner.

10. Omphalitu.

Inflammatory infiltration of the abdominal integraments which surround the stump, with swelling, pain, purplish discoloration, gangrene, or abscesses, and consecutive peritoritis, occurs within a few weeks after birth, and is the result of traumatic or soptic influences The dermatitis requires applications of lead wash; tendency to suppuration, moist antiseptic (or aromatic) applications, such as Thierseh's solution (salieviic acid one part, horic acid six parts, water one hundred and twenty-eight parts); the presence of pus, a large incision, with antiseptic after-treatment. Cold applications are not tolerated. Buthing is painful. Any of the antisepties mentioned previously will render good service. Carbolic acid must be avoided: lysol, in a two-per-cent, watery solution, potassium permanganate 1 to 500 or 1000, thymol 1 to 1000, aluminum acetale two to three per cent, and when ulceration is extensive, powdered hismath subgallate (better than in a vaseline ointment) will do much better. Erysipelas is no uncommon complication in certain spidemics; absolute alcohol, ichthyol in water or with vaseline (ten to fifty per omt.); during the time of great irritation the lead and opinm wash with attention to the effect of opium, which, however, is not readily absorbed through the swelled and inflamed tissue, are indicated. Generous freding by a wet-murse, alcoholic stimulants (from one to two teaspoonfuls of whiskey or brandy daily), plenty of water, and evacuation of the howels by injections are the additional aids in treatment. The main reliance is on the local treatment,-viz., large incisions and autisepsis.

11. Umbilical Gaugrene.

This is the result of an inflammatory process, mostly in a prematurely born buby, or one that fell sick with diarrheas. It may extend inward to the intestine and terminate in perforation. The prognosis is very had except in the few cases in which there is a nell-marked line of demarcation. The treatment consists in antisepsis and stimulation.

12. Arteritis and Phlebitis.

The former is very much more frequent than the latter. Artesitisis often connected with general sepsis, pneumonia, plenrisy, peritonitis, arthritis, and subcutaneous abscesses. The infection reaches the arteries from outside through the lymph circulation, begins in the connective tissue surrounding the vessels, and attacks the adventitia first. To discover the source of infection is sometimes very difficult; in his experiments Builin succeeded even in forcing septic material through the cord from beyond the imbilical ligature. Pus can soldom be squeezed out of the arteries, and the diagnosis is sometimes made at the autopsy only. The disease begins often before the complete separation of the cord, absorption taking place through the cord, which dries and shrinks irregularly, and admits infection through the newly formed cuts or fissures.

The treatment is indicated by the causes, which are self-infection from a putrelying surface, infection by soiled fingers, cloths, baths, applications of any kind, the contact with a septic mother, or the contact with anything septic,-for instance, the pus of ophthalmoblennorrhum, or the decomposing lochial discharges of a healthy woman. Thus the successful treatment is mostly preventive. The seissors, cloths, and sponges used for the newly-born must be aseptic. The baby must not be in the mother's bed, and must be attended before the mother on the days following her confinement. The lands touching the habe's body must be carefully cleaned and disinfected many times a day, the cord and umbilical wound treated as detailed above. They should be kept tied up conscientiously. There should be no possible contact between them and the focal discharges, be these ever so normal; if there he diarrhus the greatest caution is required, for the danger of infection is imminent. If the mother suffer from proceparal sepsis the baby may be permitted to murse, but should, in the intervals, be kept in another room and carried into the presence of the mother for the purpose of nursing only, and contact avoided. The internal treatment is identical with that advised in omphalitis and gangrene.

The symptoms of phichitis differ sometimes from those of arteritis in this,—that there is more peritoritis of the hepatic region from the beginning, more epigastric meteorismus, more icterus. Now and then ous may be obtained by gently squeezing along the course of the vem. The infection is either direct, through the vein, in which an ulcerous process is sometimes found half an inch or an inch above the navel, or also through the lymph-current in the surrounding connective tissue and the adventitia of the vessel. The treatment cannot differ from that of arteritis. Recovery is possible when the absorption of the poison has not been very copious, or elimination progresses with absorption at an equal rate. A female haby of less than three pomuls, in my experience, exhibited no other source of soptic infection than a slight erosion or alceration of the umbilical stump, with hardly any socretion. She recovered, though the process extended to the end

of the second week, with temperature reaching sometimes sog. F. Chronic septico-pyamia, which lasts a year and more and furnishes the usual kind of abscesses all over, may sometimes be traced directly to umbilical infection of a mild degree. Such cases may get well when the abscesses one and all are incised and treated antiseptically. To what extent an antistreptococcus scrum may be found available (certainly in such cases only in which the streptococcus is the infecting agent) remains to be seen. Crede's continent should be tried.

13. Paesperal Sepsis: Acute Patty Degeneration (Buhl). Epidemic Hamoglobinuma (Winchel).

The treatment outlined in the last chapters is to a great extent also that of the presperal sepsis of the newly-born contracted before birth, or immediately after, from the mother (umbilical changes, fever or collapse, peritonitis, plemritis, preumonia, meningitis, jaunilice, diarrhoxi,—in fact, all the possible symptoms of septico-pyamia). It takes more than "an ounce of prevention;" but, after all, prevention is all that can be done. Recovery is a hare possibility only, but should be hoped for; that is why internal disinfectant treatment (Credé) and attention to abscesses should not be omitted.

Acute fatty degeneration of the liver, heart, and kidneys, also of the lungs and the intestinal villi, with multiple hemorrhages, jaundice, cyanosis, romiting, and diarrhora, does not seem to get well. It lasts from one to two weeks. It need not necessarily be the result of some acute influence. Fatty degeneration (chronic) may be a slow process of intra-uterine malnutration. George T. Elliot, forty years ago, presented to the New York Pathological Society a full-grown futus all of whose tissues were in fatty degeneration to such an extent that during the extraction of the focus necessitated by the existing breech presentation limbs and parts of limbs were torn off. Almost the same may be said of epidemic hamoglobinaria (Winclot), which exhibits the same symptoms, to which is added the presence of lucnoglobin in the urine. It is of a brownish-red color and contains no blood, but renal and vesical epithelia, casts, and cocci.

Sepsis derived from the mother need not be of long duration. Indeed, the embryo appears to be better protected against the poisons of the maternal blood than the fextus, for in the forms its placental silli float free and loose in the maternal blood, while in the embryo (as also in mammals) the maternal and the fortal tissues meet like the interlaced fingers of two hands.

14. Undiffical Hemserhoge.

This may take place from the arteries either before or after the separation of the cord. Its treatment is either mostly preventise or the indications become so clear in every individual case that it becomes easy to fulfil them. Though the pulmonary aspiration and the great contractility of the muscular layers of the arteries render a himorrhage difficult, even when no ligatures were applied, an insufficient development of those unscalar fibres, or the presence of asphyxia, or atelectasis, or a pneumonia, may produce a disposition to bleed. That is why the ligature to ligatures should be tied accurately. In such cases of bleeding it may become necessary to apply an additional ligature. The arterial power being greatest in the abdominal cavity and near the umbilical ring, the cord must not be cut near the body. Two ligatures, as described above, are a fair preventive. Tight abdominal bandages impede circulation, and should he avoided. When the cord is cut too short or torn off, it may be impossible to necure the vessels; in such cases two long hardin needles should be run through the abdominal wall near the vessels, crosswise, and a strong ligature tied underscath them. The same procedure may be resorted to when the hemorrhage takes place after the separation of the cord, either from the blood-vessels or from the slowly healing surface, in consequence mostly of inconsiderate handling. When the hemotrhage ceases, a moderate compression of the wound, which is covered with iodoform or the saliestic acid and starch powder and borated cotton, by means of a handage, will answer well. In obstinate cases antipyrin in a twenty- or fifty-per-cent, solution should be applied. No iron. When the surface is granulating the proliferations may be touched with the solid stick of silver nitrate.

All such cases yield a better prognosis than those resulting from lumophilia, congenital syphilis, general sepsis, or sente fatty degeneration. In these conditions the blood coagulates with even greater difficulty than that of the healthy newly born, and not infrequently all attempts at stopping the blending are liable to prove futile. Besides, internal bemorrhages are very frequent (stomach, intestines, lungs, kidneys). The ligation of the whole mass is often unsuccessful because the stitch-channels will also blood; chemical styptics are too often useless; plaster of Paris has sometimes proved successful, and the actual camery has proved advantageous in a few cases. But the majority of such cases terminate fatally. Antipyrin solution (twenty-five or fifty per cent.) should be applied, followed immediately by a few drops of a saturated solution of tampin. Feeding

and stimulants (whiskey, music, ether, camphor) are self-understood. Gelatin may be used here as in other homorrhages, both externally and subcutameously (a two-per-cent, sterile solution).

If the case be one of syphilis, daily subcutaneous injections of corrosive sublimate should be tried (a to tooo). A suggestion of Bienwald, who applied fresh coagulable blood of a healthy person to the bleeding wound of a hemophilic patient, with the result of causing coagulation and inversing recovery, is here reported for what it may be worth. A. E. Wright claims a styptic effect of a solution of fibrin ferment and calcium chloride.

15. Icterus.

A certain degree of yellowish discoloration of the skin is the result of the normal changes of harmatin deposited in the skin during the rapid transition from focal to postnatal circulation. When by retarded separation of the newly-horn from the mother, and compression of the placenta, the amount of blood in the circulation of the infant is unduly increased, this form of harmstogene jaundice is rather more developed. Besides, the disintegration of many bloodcells causes directly an increase of bilirabin. The simplest form of hepatogene icterus is produced by the sudden diminution of the blood circulating in the vessels of the liver, which encourages the exosmotic transition of bile from the bile-ducts into the adjoining bloodvessels. That is ulty bables who rapidly lose weight (and blood) are very hable to exhibit intense degrees of jaundier. Another cause of jaundice of the newly-born is the immediate absorption of bilirehin into the circulation; for meconium having accumulated bilirubin since the third month of utero-pestation, and peristalsis being. as a rule, slow, absorption becomes easy through the open thectusvenous Arantii, which remains patent at least a week in the large majority (Quincke, seventy-seven per cent.) of cases, and through the bemorrhoidal plexus (v. hemorrh, media). If peristalsis be very slow, jaundice may begin in the second week. That is why premature babees in whom the ductus venosus is large are apt to be much tanndiced; and why Elsaesser found no jamelice in three cases that exhibited a closed ductus; and why, finally, many a liver of newly-born interic babies does not participate in the interic process." All of these forms of jaundice, while mild, require no treatment. Duodetail eatherh will produce, in rather rare cases, icterus in the newly-

^{*} Cases like those of Hayers, in which the blood contained hile while the strine had more, are rare indeed

born, as it does in advanced age. That is why the feeding and the digestion of the haby must be carefully watched and the air pure The routine administration of syrup of rhubarb is a mistake on the part of the female busybodies which should be discouraged. Mayle, also, some of them can be taught that acid cow's milk and indiscriminate feeding in general, and exposure, tight landaging, and cold feet, can do still more harm than even their medicines. Idents resulting from congenial obliteration of the large biliary ducts, or from congenital cirrhosis, or from acute fatty degeneration, or from epidemic hemoglobinaria is incurable. Icterus during septic infection is a had symptom, and rarely terminates otherwise than in death leterus depending on congenital syphilis of the liver is grave, but I have met with several cases that recovered. A thorough and energetic antisyphilitic treatment is the only safeguard in such cases. It may prove unsuccessful, however, because the syphilitic process of the connective tissue is not confined to the liver, but extends to the rest of the organs. Mercury must be administered for a long time a twentieth or a twelfth of a grain of calomel three times a day; careful inunction of a scruple of blue outment daily; or one-thirtieth of a grain of corrosive sublimate in a one-fifth of a per cent, solution of distilled water for subcutaneous injection daily. In the beginning of the treatment two of these medicaments may be combined, or one of them, together with the internal administration of from three to five grains of potassium iodide daily, in three doses, which are given after neals. The internal administration of mercuric techloride is also well tolerated; one-one-hundredth of a grain may be given in a teaspoonful of water-every two or four hours, and continued many oveks.

16. Melana Neonstornin.

Hemorrhage from the bowels (more frequent than from the storach) occurs on the second or third day of life, very rarely before, but sometimes later within the first week. Syphilis, acute fatty degeneration, epidemic hemoglobinuria, and sepsis of other varieties—also asphysia and atelectasis, together with the normal incompetency of fortal tissue—cause a predisposition; also pulmorary obstructions, cardiac disease, and a widely open ductus Botalii with consecutive intense congestion. Leopold Fischer (Müsch, med. Work, 1897, No. 19) suggests as one of the causes the delayed cutting of the cord. A baby of three thomsand grammes contains about one hundred and sixty of blood. When eighty or one hundred grammes more are pressed into its circulation from the placenta, the blood-pressure

may become too high. But is all of this amount really entering when no pressure is exerted? A thrombus emanating from the latter, or one coming from the ductus venoeus Arantii (Landau), may cause an embolic ulceration of the stomach or duodensum. The blood is fluid or congulated, rather black, like that of hierarctenesis in advanced age. It is, however, mixed with the food and rather reddish when it was swallowed while nursing. A mistake in diagnosis may happen when blood is swallowed during an operation on the lip or cheek or during an epistaxis resulting from an injury. A single observation of the latter kind was published lately, and generalized as the cause of meliena. Bleedings of this kind do not exhibit the pallor, cyanosis, and collapse of the genuine affection, provided such an epistaxis is really traumatic. In most cases, however, a congenital epistaxis is itself the result of septic infection (or syphilis).

The quantity of blood evacuated from the bowels is sometimes enormous, surticularly in view of the fact that the weight of the blood in the body of the newly-born amounts to little more than five per cent, of the weight of the baby. The cases complicated with vomiting are the worst. These result mostly from the presence of ulcerations in the stomach and disodenium. Hemorrhage into the peritoneal cavity is exceptional only. Competent respiration and an aseptic umbilical wound are the best preventives. Babies should cry from time to time to stimulate and strengthen both circulation and respiration. The treatment consists in applications of ice to the epigastrium, while the limbs are kept thoroughly warm by artificial means. Tincture of chloride of iron may be given in drop doses. Food is to be given at a low temperature. Rectal alimentation is mostly useless because of the frequency of discharges. In a desperate case of aniemia and collapse the subcutaneous injection of a sterilized salt-water solution may prove helpful. I could not convince myself of the mefulness of subcutaneous injections of ergot; but gelatin in sterilized solutions (two per cent.) may be used subcutaneously. In a case lately reported a solution of from three to five per cent, was given internally, two tablespoonfuls every two hours, and two hundred and fifty cubic tentimetres (eight ounces) of a three-per-cent, solution were injected twice daily into the rectum. As the halvy carried these large quantities, the case books like a favorable one, prognostically." Altogether. about three cases of melana out of five have recovered.

^{*} Ernst Levy and Higo Bruns (Mittheit, Grentpels, vol. x., 1902) report that gelatin, which was used by the Chinese in the third century A.D. may came thromboses not only in the blooding turface but in undestrable places

17. Trimuss and Telanus.

Its prognosis is not quite so bad as it was believed to be formerly. Now and then recoveries have been reported, and I have seen them myself, though the cases observed by me have not been very numerous. The prognosis is better when trismus appears at a later period after the separation of the cord than usual, and when its course is protracted. Cases lasting more than five or six days are rather promising. Such as set in early and exhibit a high temperature (from 106° to 111° F.) with disturbances of respiration and great immition, are bad. As a preventive, it has been proposed to remove women, for the time of their confinement and recovery, from districts where trismus is endemic. At all events, the greatest care should be taken of the unhilical wound, through which most of the invasion of the specific bucilius takes place. Towels and clothing must not have tain on the floor, dust must be carefully excluded. Some of the cases are mild,-that is, not fatal. Maybe they are those only which are due to excess of temperature, high or low, -there are those of "rheamatic" origin, -or to lesions of the brain or medula oblongata. Food must be introduced through the rectum or the nose, and as much water as possible. For days after no food could be swallowed when introduced into the mouth, the patients were sometimes able to swallow whatever was thrown into their pharvny. By means of a medicine-dropper or a small teaspoon fluids may be poured down. Medicines must be administered subcutaneonsly, atropine sulphate in doses of one-one-thousandth or one-sixhundredth of a grain a number of times daily; curare, one-twelfth to one-third; it paralyzes the muscles and works well when given in such doses as will counteract the reflex irritation of the nuscles without paralyzing them (Scharlau in Festschrift); extract of calahar, one-half of a grain. A few of my cases got well with chloral, mostly per rectum, in doses of from one to five grains from six to ten times (!) a day, and occasional inhalations of chloroform. High

also, and, informinately, tetanise, the hacilli of which are insis frequently found in the galaxis of the marker. The netamor hacilli require at least forty minutes' heating at 100° C; that degree of heat cannot be obtained by mere boiling, the less to became colloid solutions of two or ten per one, galaxia require more heat than water. Perfect safety causes be attained except in moving strain.

Paul Krame (Berl, M. Wock, July 21, 1902) advices the sterilization of the gelatin milition on five successive days, one-half hour each time, in rapor of 100° C, and also that there should be a place (a hospital) at which practitioners should at over time procure such a sterilized solution. temperatures may be influenced by antipyrin or phenoretin, combined with witiskey or brandy. Bathing is contraindicated because the baby bears no handling. Even applications of cold mater for the purpose of reducing high temperatures, if used at all, should be local only, and made without turning or tossing the patient.

All this medication is not rendered superfluous by the subcutaneous administration of the antitoxin, first introduced by Tuzoni and Cattani. One case out of four of Escherich recovered under the use of three doses of three decigrammes (five grains) each injected in the course of two days. The chemical poison ("tetanin") evolved out of the invading bacilli is not absorbed at once; the invasion is more or less persistent and should be stooped in the admitting wound (mostly the umbilicus) by the actual cautery, or by applications of tineture of iodine, or of a one- or two-per-cent, solution of vodine trichloride, or a one-half-per-cent, solution of potassium hydrate, or a one-twentieth-per-cent, dilution of hydrochloric acid, or a one-percent, elitation of crosol (Sahli, Deutsche med. Zeit., No. 11, 1805). Similar rules are given by the Health Department of New York, Of the antitoxin, twenty cubic centimetres are a dose for an adult; accordingly, one cubic centimetre seems to be appropriate for the newly-born (Archives of Pediatrics, July 1, 1897). Perhaps the best method of introducing the antitoxin in doses of from one to three cubic centimetres is the lumbar puncture in as large a quantity as that of the cerebro-spinal fiquor which was first withdrawn. To facilitate the operation, the opisthotonos should first be relieved by chloroform or chloral or morphine.

18. Bleusorrkau.

Elementaric conjunctivitis may be prevented by repeated disinfectant injections into the vagina of the woman in labor. For that purpose a solution of three parts of carbolic acid in one hundred of water, or one of mercuric hichloride in one or two thousand of water, is sufficient. After the newly-born has been bathed, a few drops of a two-per-cent, solution of silver mitrate (or a one-twentieth-percent, solution of mercuric hichloride) are applied to the cornea. When the disease is established, both eyes are affected in most cases. When but one, the healthy eye should be covered with a disinfecting lotton and borated cotton, and its infection by sponges, towels, water, and fingers guarded against with the greatest care. The diseased eye times he kept scrupulously clean by pouring tepid water over the cornea, or (and) removing the pas by recons of small pellets of horated cotton. To exceed in this the upper and lower eyelids must be turned out. This is not always easy, and is never satisfactory unless the comea becomes perfectly visible during the numbulation. Once a day the application of a mitigated stick of silver nitrate (nit. arg., 1; nit. sod., 2) is useful. It may be substituted by a two-per-cent, solution of silver nitrate in water. In both cases the diseased surface should be washed with a mild solution of table salt afterwards, and ice-cloths, small and as well pressed out as possible, applied every ten minutes or oftener. When the comea is vicerated, a few drops of a solution of atropine sulphate (1 to 200) may be instilled several times daily.

Lately G. Schallern experimented on the eyes of nine hundred and seventeen new-born in the obstetrical clinic of Göttingen. Not more than two bubies became affected, and on the eighth day only; all were saved. The slight irritation following (in some cases) the application of the two-per-cent, solution of silver nitrate subsided without any injury. When that irritation is observed, no new application should be made in the next twenty-four or thirty-six hours (Archio f. Gysale., 1897, p. 86). Of nineteen lumdred and seventeen cases reported by Runge, not one was affected after the treatment with olver nitrate solution; of that number, nine hundred and twentyeight had a one-per-cent, solution only to avoid the local irritation sometimes encountered with a stronger solution. The application should be made within an hour after birth.

19. Umbilical Pungus (Granulona), Adenona. Cyris.

The umbilical stump requires frequent inspection. Unless it ciratrizes speedily, granulations will spring up from its surface and form into small tumors. They are either sessile or pedimenlated, and are apt to grow very fast. They are not amositive, but ups to blood. In some cases they are discovered on very close examination only, and may remain many years, even to advanced age. Exceptionally such a fungus is not, or but partly, the result of granulation, but consists mainly of the remnants of the omphalo-mesenteric duct (with unstriped muscular fibres, tubulated glands, and cylindrical cells) or of the allantois. Once it was found by Vinchow to be a surcoura. Waldeyer met with some that were adeno-surcounta.

Usually it requires no excision, but only canterization or astringent and antiseptic applications. Silver nitrate may be used, but must immediately be neutralized by sodium chloride. Other applications are: a drop of liquor subsulphatis ferri once or twice daily; bismuth subgallate; iodoform: one part of salicylic acid with five parts of starch. If the granulous is large, or when it returns, it

should be removed with the scissors and the stone scraped off. Dry antiseptic treatment is to follow (bismuth subgallate, aristol. noscoben). The penistent emphalo-mesenteric duct, which presents itself as a small tumor after the cord has fallen off, should not be taken for a granuloma. This anomaly is observed in different degrees. In the milder forms, even those in which a fine sound entered the intestinal tract, the actual (thermo- or electro-) cautery would destroy the tumor and cause the fistula to close, Korte's assertion to the contrary (Deutsche med. Week, 1898, No. 2) notwithstanding; but when the fistula is so large as to admit a prolanse of the intestine into it, nothing short of a careful aseptic operation will answer. The incision must surround the tumor, and be carried far enough to permit the diverticulum to be drawn out. It has then to be separated from the jejimum, the intestinal wound is closed with sutures, and the bowel returned to the peritonnal cavity. Several such operations have proved successful.

L'inhilical cysts may owe their origin to remnants of the omphalomesenteric duct or of the arachus. A few were due to atheroma, or were eclinococci, or dermoids, or due to a strangulated umbilical sac. Possibly a strangulated peritonitic exudation dating from early feetal life may also be credited with the same result, exactly like some of the hydrocoles of the spermatic cord.

20. Umbilical Hernia (Outhalocele)

Omgenital ambilical hernia (exomphalos) is called a fissure of the median line of the abdominal wall; it is the result of an arrest of development. When the fissure is small and the sac contains intestine only, the condition is considered incurable. There is no reason why an operation on these cases, in which the abdominal defect is small, should not be at least as successful as those on more pronounced ones; for when the sac is large, containing at least a portion of the liver, together with intestine, the contents may be reduced and the cases cured. Twenty four such cases have been collected by Kocher.* C. Brenz reported the case of a girl weighing two thousand seven hundred grammes at birth. When the hernial contents had been reduced, which was accomplished with difficulty, he caught the edges of the sac by means of a pair of pincers, removed it with scissors, applied three percutaneous ligatures, removed the clamp, applied the actual cautery to the stump, and covered it with

^{*}A Jacobi, The Innestinal Diseases of Infrincy and Childhood, Detroit, 1887 p. 169.

antiseptic drawings. Both these and the ligatures were removed on the eighth day. The operation proved successful, though there was peritonitis as early as twenty-four hours after birth. D'Arcy Power reports an unsuccessful one ("Surg. Dis. Child.," 1895). Haller (Rev. de Gynic. et de Chir. elblom., 1900) collected fifty-eight operations performed within thirty-six hours after birth, of which fifteen cases died; seven performed between the thirty-sixth and fortyeighth hours, of which three died; two on the thirth day, of which one died; four after the third day, all of which died. The operation is contraindicated when omphalocole is complicated with other congenital anomalies.

Acquired umbilical hernia, which contains small intestine and peritoneum, and is produced by the large size of the cord, by learness and insufficient development of the baby, by the muscular sasufficiency and abdominal flabbiness of rharbitis, and by screaming, coughing, and the straining consequent upon diarrhesa, constipation, phinosis, or and fissene, demands the treatment indicated by these causes, and reduction, which is almost always quite easy, and retention, which is by no means so easy, within the abdominal cavity. The ordinary trusses are misvailable, or even injurious. Whatever appliance is used should be larger than the aperture and not too hard. Linea er lint compresses, plates of cork covered with linea or lint, may be held in position by means of a handage, to which they can be fastened by stitches or pins. Knitted handages are more useful than those of linea, cotton, or flamed cloth. Adhesive plasters are used frequently, but are generally too irritating to the sensitive surface of the infant.

Incarceration and strangulation of an umbilical hernia are very rare, but there is on record a fair number of cases in which herniotomy was performed successfully on infants of a slightly advanced age.

Inguinal hernia is a curable disease. When the short and straight inguinal canal of the newly-born becomes more oblique and the adjacent fat increases in the course of a few years, the rupture will disappear, provided a proper truss has been retained for a long time. During that period the intestines must not be allowed to protrude at all. The truss must be worn day and night, with the exception of such times when the infant is sleeping quietly. A good fit does not mean undue pressure. The testicle must be closely waithed. It is found high up in the scrotum, behind the hernia. Sometimes it has not descended into the scrotum, and is then mostly discovered in the inguinal canal. By gently pressing it downward and applying the truss above, we not only protect it but facilitate a complete descenses. Mr. William Couten's (1848) appliance "consists simply

of a skein of kunh's wood; for infants Berlin wood is preferable. This encircles the pelvis, one end being passed through the other at a point corresponding with the luguinal ring; the free end is carried between the thighs, and is fastened behind to that portion which forms the cincture. This simple and cheap contrivance can be worn during the morning and evening ablutions, and then changed for a dry one. No attention is required on the part of the murse, except at the moment of changing." (D'Arcy Power, "The Surgical Diseases of Children," Philadelphia, 1865, p. 414.)

For such cases as prove too obstinate a radical operation becomes advisable; in some it is inevitable. (D'Arcy Power and the special works on surgery. See also Digestive Organs.)

21. Congenital Constipution.

Malformations of the intestinal tract, such as strictures or complete interruptions; will either terminate fatally (when inaccessfule) or require surgical treatment. The latter class includes imperforate anns and rectum. In these cases, the obstruction being complete. we cannot speak of constipation. This latter condition may, however, be found to depend on an anatomical peculiarity which is quite frequent, and may give rise to mistakes in diagnosis and treatment. The colon descendens of the newly-born is quite long. The signicid flexure, which I have found to measure as many as thirty contimetres-(twelve inches), is bent upon itself several times in the narrow pelvis. Thus the convolutions of the intestine will press upon and compress one another 8 to such an extent as to result in obstinate constitution. In some extreme cases the habites died without or with coloromy. which was performed on the strength of a mistaken diagnosis. The treatment of that congenital form of constination must be adapted to the anatomical condition which gives rise to it. Rectal injections alone, non-irritating (tepid water or saline solutions), in large quantities, are rational. They must be made daily, at least once a day, and continued up to the completion of the fifth or sixth or even seventh year. At that period the normal relations of the several parts of the intestine are established, the pelvis becomes larger, and evacrations of the bowels easier. No purgative medicines must be resorted to, inasmuch as the obstacle is mechanical only. There is, however, a single indication for their administration.-viz., those symptoms depending upon constipation, which point to the absorp-

^{*}A. Jacobi. The Intestinal Diseases of Initiacy and Childhood, Detroit, 1897, p. 184

tion of intestinal toxins above the obstruction. Septic fever, high temperatures, and serious reflex symptoms—such as convulsions may require the speedy evacuation of the bourds by means of mild jurgatives. Powerful medicines are rarely denanded; in most cases a traspoonful of hones or of sweet butter will suffice. Further advice will be found in the discussion of constitution. Though such occurremoss be rare, they should be looked for: (See "Non Nocere" in Trans. Eleventh Internat. Med. Congress, ov N. V. Med. Record, May 19, (894.) Very bad cases may lead to early dilutation of the color, an anomaly which may be congenital in rare instances. Small diverticula may occur in the sigmoid flexure (also in the appendix) with rapid dilatation as a result, followed sometimes by perforation, sometimes by inflammation in the mucous membrane and inhomeous fissue, peritonitis, torsion of the intestine, and adhesions. Dilatarion is also apt to favor muscular hypertrophy by overaction and by intestinal colitis resulting from irritation by faces and by toxins.

IV

Diseases of the Blood and Constitution

I. Anamir.

ANAMIA is often the result of an hereditary predisposition, or it is congenital from some accidental cause. Mothers who suffered much during their pregrancies or were delicate themselves are hable as give birth to amenic and puny infants. Premature infants, or those afflicted with congenital diseases, such as "cyanosis" or neoplasms, or smallness of heart and arteries, are amemic and age to remain so. Another cause of idiopathic or primary aranna is found in actual loss of subitance by copious suppuration, excessive extidations in guermonia and pleurisy, or by actual hemorrhages, the results of which are in some cases perceptible through a whole lifetime. They are quite frequent in the newly-horn or young, in true melena, hemophilia, umbilical bleeding, and sometimes even in lophallacmatoma; from barelia operations or ritual circumcision; from the prolonged losses by rectal polypi; in older children from epistaxis occasioned by coryza, heart disease, or abdominal stagnation; from ulcerations in diphtheria; from trauma. Acute amenia thus caused requires external and internal styptics, the closure of wounds, the appliration of ice, and, mainly when parenthymatous bleeding is obstinate, the external use of a twenty- or even fifty-per-cent, solution of antipyrin. The subcutameous mjection of fluid extract of ergot, the internal use of lead acetate (hourly doses of two or five centigrammes (one-third or three-fourths grain), may be given ten or twelve times without fear), or of liquor ferri perchloridi (from five to ten drops amply diluted), or of calcium chloride from free to twenty grammes daily (0.3 to 1.25), stimulants internally, externally, and subcutaneonly, ligature around the extremities so as to compress the veins. warming of the surface, transfusion of defibeinated blood, or of a sterilized salt solution (6 to 1000) are ant to meet the most urgent necessities

So far as chronic anomia is concerned (it is seldom "primary," but almost always secondary to seem tangible or occult cause which ought to be sought out). I cannot do more than simply allude to its direct and indirect causes for the purpose of obtaining the indications for treatment. Among the former are prominent an insufficient amount or an improper composition of food and an insufficient

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supply of oxygen. Poverty with its wants, its squalid and airless dwellings, and overwork in overcrowded school-rooms, are all powerful sources of widespread anomia; they become social problems more than merely medical questions. Among the indirect causes I comit every disease of more than a temporary character; all those ailments which so change the alimentary or digestive organs as to interfere with antrition; slow hemorrhages; intestinal worms, which are sometimes borne without symptoms, sometimes irritate and amount (oxyuris, ascaris), sometimes, however, interfere with assimilation to such an extent as to cause the gravest forms of amenia (uscaris, tænia, bothriocephalus); diseases of the organs of respiration, circulation, and elimination (kidneys); all feverish diseases, and particularly the infectious fevers (scarlatina, malaria, least of all typhoid fevers, unless they result in chronic intestinal nicerations); discuss of the lymph system (including what is meant by "lymphatic condition" in the writings of many modern anthors), most of which are accessible to successful treatment. It is true that pseudolenkæmia, leucocythæmia, and pernicious and kindred anæmias offer the same difficulties which we meet in the adult; but the many glandular swellings-" scrofulous" or not-permit of successful treatment, both preventive and curative.

All of these affections, the number and names of which I do not care to multiply, are the more dangerous, and require the more dietetic and medicinal attention, the greater their detrimental influence during infancy and childhood,—that is, during the period of growth, in which the organism has not only to sustain itself, but to increase steafily. The latter consideration is a very important one. It includes the necessity to which I have alfuded in a previous chapter, not to permit a morbid condition, either acute or chronic, to run its full course without interference. A disease shortened a day, a sleepless right less, a dozen diarrhoral movements prevented, a racking cough soothed, a convulsion interrupted, an excessive temperature relieved, are just as many prophylactic points gained and as many causes of persistent anarmia minigated in their dangerous influences.

These considerations are the more weighty the younger the potient; for in regard to anaemia the young are in a very precarious condition indeed. The infant (and child) has less blood in proportion to its entire weight than the adult: this blood has less fibrin, less salts less harmoglobin (except in the newly-born), less soluble albumin, less specific gravity, particularly between the second and twelfth months of life, and usually more white blood-corpuseles. It has a specific gravity of best roas or roap compared with that of ross in ANÆMIA 115

the adult. The total amount of blood in the young is relatively small. Its weight, compared with that of the body in the newlyborn, is 1 to 19.5. The relative figures in the adult are 1 to 13.*

Hence it follows, from a practical point of view, that it is important not to permit the proportionately small amount of blood in an infant or child to be unduly diminished or diluted. That is why the subject of feeding and digestion is of such paramount weight in pediatrics.

While it is a good rule to be careful in regard to the amount of food to be given in the beginning of a feverish disease, a fair quantity should be allowed after a while, provided it is fluid and well selected. Unless there be a contraindication in the condition of the

*According to the researches of Ernst Schiff (Jahrh d. Kinderheille, vol. lin.), the specific gravity of the blood of the newly-born (smile or female) is 1000 to 1070 in the first see days, in the following four days 1070 to 1000, a little higher in the day than in the night, less in the interior after the fourth day, more in the well developed than in the weak, and more after delayed liganore of the cord.

The blood of the newly-born, the infant, and the child undergoes rapid charges. According to Monti (Wiener Med. Presse, 1894, No. 41), the specific gravity at barth is 1055 to 1056, at from two to four tweeks 1056 to 1059, at from two to tweeks 1056 to 1059, at from two to tweeks 1056 to 1056. Its specific gravity increases with larger body weight, with perspiration, in gives monia. (rapid fall during crisis), and in the feverish state of malaria, typhoid, and pleuring, frequently also during cardiac diseases. It dimensibes rapidly after drinking, in acute sephritis (1047 to 1038), in non-cardiac chorea, in tuberculosis, dyspepsia, and intestinal catarrh. In all forms of marmin it may vary from 1040 to 1048. According to Max Carstanjen (Jahrh f. Kind., vol. 1813, there are on the first day of life many polymacker leucocytes, few lymphocytes, between the sixth and nurth days both forms are equal, on the twellith many lymphocytes with plenty of transition torms. Until the third day there are many nucleated red blood-cells; no increase of costneptile cells at that time.

The leanneymen are rather more comparent in the marshing than they are in the adult; Hayern says 18,000 to 5,458,000, Alired Japhe 13,500, with predominance of the monoraclears, and only forty-two per com. of polymerlears. These are not increased in intestinal diseases, unless there he toxins of patterfaction or of pathogenic bacteria. There is an increase of leavneytes in most scate infectious diseases, except when the prognosis is a very had one the first day of the illness, or in tophoid or mularial fevers, in postmonia, and in the peopperal sepois of the very young.

The specific gravity corresponds mostly with the number of erythrocytes and the amount of hastoglobin. Both are high when the entiting of the could wan delayed. Hamoglobin and iron non-mostly parallel. The percentage of iron is fow in the nursling, is nephritis; it grows when exclusive milk feeding, is support and cereals, fruit, and animal foods are given. It increases very gradually; even about pubersy it does not reach the percentage found in the adult.

stomach, a fair amount of albuminous nutriment (milk) should be administered, with the addition of such foods as contain more iron (animal foods, cereals). During protracted diseases the danger of manifion becomes imminent, still more in the young than in the adult Convalencence requires generous feeding and stimulation also, with this restriction, that the meals should be small and frequent and the stomach sustained all the time. In this way many a case of secondary amounts may be avoided. (Chapter I.)

Bahies become americ when their mothers or nurses have too little milk, or when the supply is ample but of improper quality. Nursing during a subsequent pregnancy ought to be forbidden. It most not be continued too long, certainly not beyond the protrusion of the first group or groups of incisors. Nor must it be continued beyond the tenth month if at that time no tooth has made its appearance. Many a case of internia or rharbitis will be cured by a change of such faulty diet. It is better for the huby to develop teeth, hore, and marcle on barley or natmeal and cow's wilk and beef-broth than to become round with extensions fat, and amenic on its mother's powerful syrrasthy and powerless breast-milk. Maternal love does not improve the breast-milk of a person with a history of consumption, rickets, stybilis, servous disorders, or intense amenia. Sometimes even a healthy woman has a milk which is not adapted to that particular haby; then another woman or artificial food must be preferred. The addition of barley or natureal and beri-soup or beri-tex is always advisable when a nursling becomes argenic without having been afflicted with a tangible disease. A small piece of beel, half an egg daily, a crust of bread, may be added about the end of the first year. The diet ought to remain simple and mostly fluid or senisolid until the child is two years old. Prevent had ladits, such as fast eating, and enforce regular defecation (not by medication), plenty of exercise out of doors, and undisturbed and long sleep in a cool troom. Avoid crowded school-rooms and protracted lessons. "We have laws to protect children from being sent to work in factories or to be employed on the stage, but none to protect them from the equally destructive, incessant schooling in close rooms, without air or exercise. There are too many books bought for Christmas and too few deates" (Arch. of Med., February, 1881).

The subjects of nersing and artificial feeding and of digestive organs have been treated of elsewhere; " therefore I abstain from

^{*}A. Jacobi, 'The Investmal Diseases of Infancy and Childhood Detroit. 1887, and in Chapter I. of this book.

discussing the matter here beyond the above fragmentary remarks. What cannot, however, he emphasized too much or too often is the necessity of resorting to animal food—soups, icas, peptones—in cases of infantile amemia.

The medicinal treatment of anzemia most fulfil the causal indications first. That which depends upon chronic gattric relarrie requires, according to circumstances, alkalies or hydrochloric acid, Besides the well-known subcarbonate (or subpensir, hismath. nitrate), the salicylate has made many friends of late. Pepsin and dilute hydrochloric acid are best when combined; a haby of a year may take six or eight drops of the latter in six or eight ounces of water daily, or the acid may be mixed with milk, according to the formula given in a previous chapter. Disease of the kidneys has its own indications. The regulation of the heart's actionwhich; when abnormal, is the most frequent cause of habitual epistaxis, and of gastric catarrh and hepatic congestion-is the first indication in secondary angenta. Many a gastric catarrh will not get well without digitalis or some other cardiac tonic, and persistent nose-bleeding is apt to improve immediately after the administration of digitalis, with or without iron. Thus, in a great many cases, amenia is "cured by digitalis." In a similar manner digitalis can be utilized for the purpose of more competent oxygenation of the blood. When the heart is weak and the lungs, by virtue of old pneumonic infiltrations, offer too great a resistance to an easy circulation in the pulmonary vessels, it is again digitalis for its equivalents). which facilitates the extensive contact of the soxygen of the atmosphere with a larger number of blood-cells.

The isometical intervation of the muscular tissue of the heart, stomach, and the rest, which is one of the most serious results of animin, is corrected very happily by strychoise or other preparations of mix. An infant a year old tolerates and requires one-fortieth of a grain of strychnise, or one-third of a minim of the fluid extract of mix, shilly, for a long time in succession. These preparations may easily be combined with any other medicinal administration.

Iran is looked upon as the sheet-anchor in anzenia. It is mostly indicated in cases of primary uncomplicated anzenia. A catarrhal stomach does not bear it well; when however, the stomach is abnormal in consequence of the general anzenia, iron improves both the general condition and the stomach. In many of these cases the addition of bitter tonics is advisable; stryclmine is perhaps preferable. Anzenia after malaria, dropsy from anzenia and chronic nephritis, anzenia with neuralgia, arcentia with (and from) valendar diseases.

which do not result in local congestion,-mainly incompetency of the nortic valve,-are greatly benefited by iron. Amenia after chronic diarrhora requires great care in its use; in most cases it may or ought to be avoided. While it is very beneficial in the predisposition to bemorrhage, it should be avoided in hamoptysis. It is centraindicated in "inflammatory" fevers, for it increases polse, arterial pressure, and temperature; but in the more serious infectious fevers, such as ervsipelas and diphtheria, it is very efficient. It requires good digestive powers, which may be stimulated by aromatic tincture of rhubarb, tineture of einchona, or stryclinine, and, to combat anomia only, no large doses. The total amount of iron introduced into the system in the average daily food does not exceed much a single decigramme (one and one-half grains), and that contained in the blood of the adult has a total weight of three grammes (two scruples) only, Still, it is quite possible that the iron introduced into the storach fulfils more indications than that of supplying red blood-cells and (to a lesser degree-even that much is doubted-) hamoglobin. Indeed, it sometimes nets as a stormelie.

Of the preparations mostly in use, either official or otherwise, I have mostly employed dialyzed iron, a few minims several times thilly, the tineture of the malate (pomate), from twelve to thirty minims daily, and the same, or somewhat smaller doses, of the tincture of the chloride of iron for children from three to eight years of age. The dry preparations are the phosphate, from one-half to two grains three times a day, and the same doses of the carbonate (saccharated). The latter is agily combined with proper doses of bismuth. The pyrophosphate demands smaller doses. The lactate is a mild and digestible preparation which seems not to be appreciated at its full value The citrate of iron and strychnine and that of iron and quiring are valuable preparations when the effects of the combinations are sought for. Coming with the recommendations of Schiniedeberg. ferratin in several daily doses of one or two decigrammes (one and a half or three grains) each has been awarded a fair trial; so have some other preparations,-the peptomate, the albuminate, the peptomanganate. The obtrusive methods of advertising them do not prove their superiority over the drugs and preparations of the Pharmacoposis and of the National Formulary. The syrup of the iodide of iron is well tolerated by the youngest inlants; as many drops as the habe has months may be given three times a day up to eight or ter drops a dose. It is well tolerated by the stomach, in which the iodisc is freed from the iron and acts as an antifermentative. Besides. experience appears to confirm the theoretical inference that it proveits power as an absorbent in cases of anarma complicated with glandular enlargements. The syrup of the hypophosphites cum ferro of the Pharmacoperia may be given in larger doses; this is the preparation which I frequently select when I mean to add arsenic or nonvenica in liquid form. It is self-understood that I prefer the legitimate preparations of the Pharmacoperia to the wares of the agents and advertisers, "physiciams' samples" or not.

Other (animal, like ferratin) preparations of iron are Kobert's humol and humogallol. It has been suggested, not proved, that their animal origin renders them more homogeneous.

For subcutaneous administration the pyrophosphate of iron with sodium citrate, also the albuminated iron, have been recommended; also, by Rummo, a ten-per-cent, watery solution of the ammoniated iron citrate, and by Lépine, one of a two-and-a-half-per-cent, solution subcutaneously. As anomia is a chronic condition which requires "chronic" treatment, and the injections cause pain and indurations, it is not very probable that this mode of employing the remedy is available.

The administration of iron appears to have an indirect effect also, which is apt to do much good. As a rule, the inhalation of saygest gas, continued for five or ten minutes, at intervals of from an hour to two hours, seems to improve sanguification and metamorphosis considerably. This wholesome action, it always seemed to me, was most perceptible while iron was administered. To admit oxygen red blood-corpuscles are required; it appears that the influence of iron on their organization and numbers renders the introduction of oxygen into the blood easier and more beneficial. Uxygen was often credited with being a general tonic, and its inhalation was considered at one time almost a panacea. So long as the organs of respiration and circulation are normal, the atmospheric air contains more than they require. Still, whenever they are disordered, in the orthogonea of pneumonia, in asthma and emphysema, in pulmonary tuberculosis, in cardiac diseases (as also in poisoning with curbon oxide or when there is methemoglobin in the circulation), and in amenia depending on these conditions, the inhalation of oxygen is of undoubted service. It has the advantage of being readily prepared pure; that is more than we can say of orone (p. 74).

Some of the worst forms of anismia are greatly benefited by arzenic. They are those which result from long-continued manifon and slow-convalescence, in which the stomach does not suffer primarily: from primary catarris: from chronic malaria: from chronic tuberculosis of the lungs: from chronic glandular swellings of a malignant type,

entier lymphona or surcoma or adenoma. In all of these form it is highly useful. The doses need not be large, but may be increased dowly. One-one-hundredth of a grain of arsenous acid, or one drop, or one and a half of Fowler's solution, three times a day, after meals, the latter amply diluted, are well borne for weeks, even months, without interruption, by a child of four or five years. In malaria the remedy may be given with quintne (and iron), in exceptional cases with ergot, in other forms with stryclinine (and iron); in pulmonary interculous with digitalis

The gradual increase of the doses of arsenic may be effected in the following numer. A deading of Fowler's solution is diluted with sixty dractions of water; three doses of this mixture are given daily. If the initial dose is to be one drop, give a teaspoonful; the next dose is a teaspoonful + one drop, the third dose a teaspoonful + two drops, and to on, fimil the sixty-first dose consists of a teaspoonful and sixty drops. Thus the original dose is gently and slowly doubled in twenty days.

Children bear arsenic better than adults and very much better than senile patients. Still, even they must not take it when they are affected with gastric disorders; nor continue it when in the course of treatment conjunctivitis, adema of the cyclids and face, or diartives makes its appearance. A modern preparation, the encodylate, appears to offer no advantages over any of the rest. Sometimes, when fourler's solution (tiquor potassii arsenitis) is not well tolerated, the sodium preparation of the Pharmacopoin (Pearson's solution) may be tried in temfold disses, or arsenous acid, alone or in combinations, in doses of one militgramme (one-sextieth of a grain) shilly to a child of two years or obler.

Among the important remedies in anomia charge of place should be mentioned,—from city to country, from lowland to altitudes and woodland. Friction with cold nature and after a while cold bathing will improve entaneous and general circulation and sanguification Mineral springs with iron and earlionic acid, so frequent in German's and France, enjoy a well-deserved reputation.

This directic and medicinal treatment, mostly so effective in simple amemias, is also indicated in citlerous when it develops in children. In them the arcatomical cause giving rise to life-long chlorosis—vir. persistence of the feetal smallness of the aorta (Virehow) with smallness of the general arterial system—cannot be wholly overcome it is here that bitten tonics should be added from time to time to the preparations of iron and digitalis to stimulate arterial and cardiac action. Both of those require the continued use of cold water—vir.

buly washing or leathing with vigorous rubbing, followed by seabathing, and systematic exercise, gradually increased. The diminurion of hemoglotin, while the number and character of the red bloodcells are more or less normal, requires ample and cantious feeding; it is here that pertones to such an extent as can be absorbed are indicated. It should never be forgotten, however, that all the symptoms of chiorosis in a child (as in the grown woman) may be caused by undiscovered malignant tumors, or by gastric ulcerations (not so very incommon), or by duodenal ulcerations, with slow and almost imperorptible hemorrhages. It may be complicated and increased (caused, according to some) by intestinal disorders leading to constipation and autoinfection, or by emeroptosis. These disorders have their own indications, which may be studied under the proper headings. In such cases from and arsenic will be combined with alkalies, with mild purgatives and antifermentatives, or with proper landaging. Nowhere more than in chlorosis should a sojourn in higher altitudes be recommended: the red blood-cells increase with rising altitudes. Christiania vields 4,070,000, Herlin (fifty metres) 4,647,000, Görbersdorf (five hundred and sixty-one metres) 5,800,000. Schöneberg (six hundred and fifty metres) 5,887,500, Reiboldsgrün (seven hundred metres) \$4,000,000, and Davos (fifteen hundred and sixty metres). 0.551,000 blood-cells in the cubic millimetre."

The tendency to dilutation and hypertrophy of the heart may be transitory only, but small doses of digitalis should be given a long time. The same treatment is indicated when there is a tendency to thrombosis in peripheral veins. The treatment of very bad cases may begin with absolute rest in bod and generous feeding.

Penticious (essential) anaruia is characterized by a decrease of red blood-cells (from four or five millions in a cubic millimetre to one or even one-half of a million), which, moreover, exhibit irregularsizes and shapes (poikilo-, micro-, and megalocytes, not absolutely characteristic, however), while hamoglobin is not reduced at the same rate. When it is caused by atrophy of the peptic glands (Kinnicutt), or prolonged interns, prolonged gastro-intestinal disorders, protracted suppuration, infections fevers, or suphilis, or entoroa (ascaris, tenia, bothriocephalus), the indications are clear. Many

[&]quot;The number of erythrosytes is also increased, but havinglobin diminished, in charmar magnitus, recentain anomia (ma) de la pina), the result of suffice exposure to high abitudes, with pulpitation, suffocation, fainting, and benorthages from the mouth and note. Thus it is the exact reverse of terricious anomia. Its indication is clearly reserval from the high abitude which masted to

such cases get well when treated for known causes. That is why every addition to etiology is so welcome. That is why William Elder could report the case of a man of thirty-live years whom he treated successfully with eighteen injections, one every other day, of ten cubic ceraimetres of antistreptococcus serum, and why there is quite an array of cases getting well with authelmintic treatment. Ewald has found atrophy of the small intestines in many cases of permitions anormia (indican? toxxemia?). Knod Faber published a case (Berl. klin. Work, July 26, (897) which soems to prove its connection with a stricture of the small intestine. If a diagnosis could have been made in his case it is possible that an operation would have prevented anzenia. As other such strictures (tubercular, syphilitic), quoted by him, are also known to have been connected with intense ameria. the suspicion is justified that an intestinal toxin caused or occasioned by them (us also by apepsia and helminthes) is the source of the rapid destruction of blood-cells and the cause of persicious amenia. If that he so, intestinal antisepsis, if it is ever accomplished to a sufficient degree, will cure many a case. Of the remedies mentioned above, arsenic in rising doses is quite effective; iron and small doses of quining act as adjuvants; bone-marrow (when raw or boiled, it nauseates quickly) or its preparations (Armour's or others), the daily doses of which may vary from one-half of one to two teaspoonfuls or more, have been credited with good effect. I have seen improvement, but no cure. Weir Mitchell's rest and feeding cure, with general massage, benefited some. The capricious appetite prefers mostly a vegetable diet, the failing digestion requires stimulants (strychmine), besides pepsin with hydrochloric acid; the absence of blood-cells and the consequent inability to bind oxygen and to produce heat denoted warm clothing and warm rooms; diarrhoss, its symptomatic treatment; and utter debility and collapse, infusion of salt water. In spite of the lack of crythrocytes, combined with shallow respiratory movements, the systematic inhalation of oxygen should be tried. An undoubted case of persicious assemia from no tangible cause in a child less than a year old I saw in Boston with Rotch and Dr. Lafd. She bore little iron and no arsenic, but got entirely well.

The prognosis of leacecythermia (leakermia), no matter whether lymphatic or splenic, is still worse than that of pernicious aramia. From the latter it is diagnosticated by the increase of leacocytes (1 to 50 to 1, instead of 1 to 250 or 500) and of ensinophile cells. Acute cases have been observed after influence and pernicious aramia. They lasted a week only, or longer; in its usual protracted form it is known to follow scalaria, influence, syphilis, glandular, intestmal, and blood anomalies. Klebs and others, besides a case that came under my observation, saw cases in the new-born, with ascites (leucocytes \$29,000, erythrocytes 4,000,000). Complications are frequent, rare with diabetes and bone diseases; and prevention is therefore a possibility. Albuminoids in blood and tissues are rapidly destroyed, therefore albuminoids in every possible shape, peptones, albumoses, etc., should be given in absorbable quantities. Rest, mussage, cold and heat, transfusions, infusions, coygen inhabitions, arsenic and iron, quinine, bone-marrow, injections of ergotin into the subcutaneous tissue, of arsenic into the spleen, electricity and galvanism, extirpation of the spleen (always fatal—should be performed early, if at all), treatment of the accompanying hemorrhage, of perspiration, of pleuritis, and of ascites,—all are in vain. I know of no authentic case, either acute or chronic, that recovered.

Pseudoleukamia (Hodgkin's disease), though there are so many transformations of this form of amemia into lencocythamia as to make a common origin (infection?) and nature very probable, has in most cases its own symptomatology (painless, swelled lymph-bodies from the neck down all over the body, swelled tonsils, liver, and spleen, no leukarmic blood, merely leucocytosis). In its history rhachitis, transata, or intestinal disorders are mentioned frequently. The swelling is not a simple hyperplasia (Dorothy M. Reed in Johns Hopk. Hosp. Rep., vol. x., 1900), but a change suggesting a chronic inflammatory process, proliferation of endothelial and reticular cells, formation of lymphoid and of characteristic giant cells, gradual increase of connective tissue leading to fibrosis, and in most many cosmophiles (absent in tuberculosis, sarconu, and lymphatic leukamia), with occasional hemorrhages, and ascites now and then, the latter sometimes without cirrhosis of the liver. The diagnosis from general sarcomatosis, which causes inflammatory adhesions between the lymph-hodies (isolated in pseudolenkæmia), is not always easy. Arsenic is again the sheet-anchor. Piperin, from five to fifty centigrammes or more daily (one to ten grains), has been recommended. Berberin sulphate seems to deserve credit in repeated daily doses of one-sixth of a grain (0.01); it certainly stops the troublescene constipution, but should not be given in such doses as to cause diarrhesa. It seems to improve the appetite and to reduce the size of the glands and of the large viscera.

Splenic anarmia, with its large spleen and somewhat swelled liver, no lencocytosis, but polkilocytosis, occasional megaloblasts, some diminution of hamoglobin, and some nucleated blood-cells, does not deserve a place of its own in our minumelature, unless the original

swelling of the spiece (with atrophy and scienous of the Malpighian bodies) be claimed as the cause of amenia. It shares the therapeutical indications of its sister amenias, which are harmless and fairly nicless. But the removal of the spleen has been quite successful, so that it should always be advised and no other chances taken. But first be sure of your diagnosis. The nomenclature of hypertrophy of the spleen with circhosis of the liver and arcites has been unoccessarily saddled with a new name, that of Banti.

2. Rhochitis,

Many cases of rhachitis which depend on hereditary influences might have been prevented or modified by attending to the parents before conception or to the mother during pregnancy. I have known women to bear healthy or rhachitical children according to the condition of health or ill health during the year preceding partirition. A number of their constitutional ailments, such as anima, tuberculcois, and syphilis, make their appearance in the offspring with the symptoms of rhachitis. If that precaution have been neglected, the injury inflicted upon the infant cannot be completely annulled; in many cases, however, it can be greatly moderated. Thus there are a great many cases of early rhachins which are the to the influence of mitigated syphilis in the parents. Indeed, some of the microscopical tone lesions of the two discuses, as they are met with in the newlyborn, are difficult, some impossible, to distinguish from one another. Such cases can be greatly benefited by an antisyphilitie (mercurial) treatment, which should be continued through a period of many months.

Attention should be paid to general hygiene. More can be accomplished by Jurnishing good air than by any other means. The air of the urinter is no contraindication to keeping windows open and to taking the young haby out so long as there is ample clothing and covering. Sea-air is preferable to long as there is no contraindication, for instance, in the condition of the respiratory organs.

Sopourning in the country is beneficial only when the rhachifical infant is not locked up in the boose. Sea-air, together with sea-bathing, warm, cool, or cold, according to age, condition, and training, is an excellent preventive and curative measure. England commenced that practice on a large scale in 1750; Italy, France, Germany, and America twenty-five years ago. The sea-hospitals have done an immense amount of good. To evadicate rhachitis, however, the children must be kept at the shore for years. In America we are always too much in a burry, and expect the benefits of heaven and earth in a

particle of a season. When no sea-shore is accessible, the lathing in salt water, with friction, massage, occasionally with electricity, may be done at home. When eczema is caused by it, the salt-water treatment should be discontinued.

Plenty of air by day and by night, coupled with poor food, is still safer than the best possible food with bad air. Comby's saying, that rhachitis gets access through the stomach, not through the skin or lungs, requires a good deal of modification. Still, the nature of the food is highly important. Lactation must not be continued beyond the appearance of two or four toeth. A net-nurse should not be too voting nor too old. Bitt, after all, even an apparently proper age or condition of the mother or the wet-muse does not always exclude the possibility of a breast-fed baby becoming rhachine. In such a case a well-selected artificial food is preferable to breast-milk. Pure cow's milk, when given as exclusive food, no matter whether raw or boiled, is harmful. The reason for this warning has been discussed in Chapter I. In addition, I will again refer to my criticism on the excess of lactic acid (milk-sugar) in the infant's alimentary canal. Excess of lactic acid appears to have detrimental effects on the nutrition to such an extent that rickets has been explained by its chemical action. Like acetic, oxalic, and formic avids, lactic acid has been claimed as the cause of rhachitis by Ch. Hritzmann, in 1873; Tripler, in 1874; Neiss, in 1876; Siedamgrotzky and Hofmeister, in 1870, while Alharel could not verify their observations. Such differences had been noticed before. Schmidt and O. Weber long ago found lactic acid in the hones of animals fed on that material; Marchand and Gorup-Besanez in the urine; while Virchow and Lehmann found the hones and the blood alkaline. After all, however, it should be remembered that rhaclitis means more than merely excessive elimination of lime by the kidneys and intestines; its pathology is not complete without the soft swelling of the peri-epiphyseal cartilage, of the epiphyses, and of the periosteum, also deformities of the bones. That is why lactic acid in the circulation should not be accused of being the cause of rinchitis. But this much is certain, that by an undue presence of factic acid the amount of phosphate of line in the urine and in the faces, at least in one of them, is at once vastly increased and that the bones are deprived of part of their calcium." Artificial foods must be well selected and watched. The absence of

[&]quot;It is an account of this and its eliminative, chemical action on hims (and thereby diametic offset), which it removes in the shape of salts, that Russyl gives lamic acid in those cases of august pertoris which depend on calcification

pathogenic germs from them is not the only safeguard. Even Rotch's modified milk and Gaertner's fat milk do not protect against rhachitis, though they be fairly proof against microbes. The addition at an early date of cereal decoctions, burley, outment, and of animal broths renders all the known milk preparations safer and more wholesome. Too large a percentage of fat in the foods of young infants should be avoided. The addition of fat is not always a protection against thachitis, and may easily be overslone. Diarrhua, dyspersia, from whatever cause, and constinution should be corrected, and the warning often expressed by me and urged by Comby should not be forgotten, that over-alimentation is at least as dangerous as under-alimentation. That the skin requires intelligent attention was suggested above. Whether a bath should be given immediately after birth and continued regularly during the first weeks ought to depend on the nature of the individual case. As a general rule, which is valid for every child, bathing-first tepid, later cooler, in salt water when there appears to be an indication for more surface stimulation, with appropriate friction-improves both the cutaneous and the general circulation.

Rhachitis due to, or connected with, digestive disorders domands the correction of the latter. Gastric catarrh is not frequently primary; more commonly it is the consequence of a faulty diet; but in both cases it is the cause of anomia, and either of insufficient or of abnormal secretion of both the mucous membranes and the glands. The gastric catarrh of rhachitis is pre-eminently acid; thus, neutralization of the stomach is often required before every meal and between meals. Prepared chalk, calcined magnesia, sodium bicarbonate, and the several preparations of hismuth find their proper indications in this comdition. Bismuth salicylate, animal carbon, and resorcin find their places, besides aromatic teas, in complications with fermentative procasses in the intestine and excessive flatulency. When the secretions of the stomach are merely insufficient, the addition of sodium chloride. in proper quantities will facilitate the formation of hydrochloric acid. When that plan does not suffice, peoslo and muriatic acid, the latter largely diluted, will take the place of the physiological gastric juice: and bitter tonics and alcoholic stimulants, also diluted, will stimulate a normal secretion. Still, the selection of a proper food forms the

of the blood-vessels, about fifteen grammer daily for months in encounter. It is self-endorstood that the food should be fairly free of line. That is why the diet is as follows: again meat, man bread, sono fish, sono points, monthly for instead green beant, peak, or countries).

main part of the indications. The principles of infant leeding, both in health and disease, I have laid down in the first part of this book; to that I refer; also to my suggestions, in the same place, on the selection of animal foods so urgently required in rhachitis (p. 41).

Cod-liver oil, when tolerated influences rhachitis favorably. As a rule, however, it is not so universally well borne in rhachitis as it. is in "scrofula." I do not advise the use of its compounds, emulsions. and so on, except when it is disliked or the latter have some other indications, for instance, diarrhera; this is sometimes produced by the oil, mainly in the hot season. In that case the remedy may have to be discontinued, or may require the temporary addition of bismuth subcarbonate or calcium phosphate. The action of cod-liver oil is considered by some hygienic only, by others remedial. The former attribute its effects to the fat, and believe the substitution of any assimilable fat an equivalent. As I said before, I do not believe its agency to be thus restricted, for three teaspoonfuls of cod-liver oil will never be replaced by three teaspoonfuls of cream or other fat Universal experience teaches its wholesome influence in many morbot tissue-changes. Possibly the mystery of its action is best explained by attributing to it a percentage, though ever so slight, of some organic tissue juice of a nature and efficacy to be compared with that of the ducties glands. Tempted by that point of view, Henbuer tried the action of thyroid gland in rhachitis, but without any tangble effect. He believes, however, that the general condition of the infants was improved by it.

Malt and "multine" preparations have found favor both with the profession and the public. Unfortunately, the market has been swamped with all sorts of combinations and mixtures to such an extent as to shake confidence in their honest composition in the same degree as the mere object of making money by them becomes preeminently clear. The preparation ordered by the United States Pharmacopæia should be preferred.

Though rhachitis be a general disease, and not merely one of the caseous system, the anomalies exhibited by the boner are apt to attract most attention. The changes exhibited in the shape of the chest, which result from the pressure of the atmosphere on the soft rhachitical ribs, are not liable to disappear entirely. The "pigeon-breast"—that is, the prominence of the sternum and (or) the costocartillaginous junctures—remains for life to a greater or less degree, according to the severity of the affection or to the restoring power of the expanding lungs. It requires early medical and surgical interference and protracted gymnastic exercise. Even crying is wel-

come, and in children of two or three years trumpet-blowing, soapbulbling, etc. The curvatures of the diaphyses of the long hones are apt to be less marked in the adult because of the extension which takes place during growth. If ever splints are to do any good they should be applied before the bones have become hard again; the ebumation following the softness of the bones after recoverresists every degree of permissible pressure. The tendency to flatfoot, acquired through the flabliness of the ligamentons apparatuduring the attempts of the child at locomotion, requires massage and sustaining by a slice mode strong enough to support the ankle and a steel spring just sufficiently strong to restore the arch of the foot; scoliosis, a Sayre's plaster-of-Paris or a felt jacket; the rhachitical groove round and above the insertion of the disphragm, well-directed gymnastics of the chest; inflexible and ugly curvatures of the long bones, either osteoclasy (fracturing of the curved bone while leaving the periosteum intact, and resetting) or osteotomy (straightening the hone after it has undergone a cutting operation). Of these two, osteoclasy was the only operation resorted to formerly. The fracture of the bones was either manual or instrumental, mostly successful in the middle of the femur or tibia, mostly unsuccessful for gern valgrm or varum, inasmuch as it often tore off the epiphysis, or fractured in an undesirable place, and was sometimes followed by septicamia-

Osteoclasy has been mostly replaced by osteotomy. It is a simple and open operation. It is seldom required on the upper extremity, generally on the lower, not so often on the thigh as for genu valgum and varum or for the curvatures of diaphyses. The genu valgum of children results from the curvature both of the femor—usually the only one at fault in adolescents—and of the tibia. It requires the supracondylar operation of Macewen, and often a supplementary operation on the tibia. The curvature of the tibia has mostly its concavity interiorly and posteriorly, and is usually found at its lower half. The operation may be either simply linear, transverse or oblique or curvature (wedge-shaped). In bad cases the latter is preferred, and not seldom a single operation is insufficient. An interval of a few weeks is ample between the several operations that may become necessary. The results of osteotomy are almost always absolutely good. Supportations are not frequent and are controllable.

During the active rhachitical process the bones will not only bend, but are liable to be changed in their continuity. It is true that genuine fractures are not very frequent because of the softness of the bones and the succulence of the periosterm. But infractions (green-stick fractures) are quite common about the extremities and clavicles. The periosteum never participates in the injury; the bone is more or less bent upon itself; the ends are not entirely separated and are easily readjusted, but require splinting until the rhachitical process has terminated in general recovery. Immobilization of the entire body is sometimes required when the tendency to infraction is quite extensive.

Many of the serious results of softness of the bones could be avoided or mitigated by precantionary measures. Babies in general, and those with incipient rhachitis in particular, must not be made to sit up before their vertebral columns and their dorsal muscles are able to support them. They must not be carried about in an erect posture, nor on the same arm always; the latter practice is an invariable cause of scoliosis, and frequently of genn valgum of one side and of genu varum of the other. They must be kept and carried about in a reclining posture; bester on a hair pillow than on the arm until they feel strong enough to do without it. Thus scoliosis can be prevented. They must be discouraged to walk before their limbs are sufficiently strengthened; no walking baskets should be employed, no fond and proud grandparents allowed about; thus the curvatures of the diaphyses of the lower extremities, which in part result from the vertical weight of the body on the feeble limbs and the secondary deformities of the pelvis, are reduced to a minimum.

Cromiotaber, the rhachitical softening of the cranial bones, is one of the entitiest symptoms of the disease. The bones which commenced their postmatal ossification in a normal manner begin to soften to such an extent that the parietal and occipital bones exhibit a number of spots in which the osseous tissue has nearly or entirely disappeared. The hair falls out in that neighborhood, the scalp is perspiring copiously, the veins are dilated, the bones and meninges become hyperamic, and meningeal effusions are quite frequent. The softness of the bones results in asymmetry of the cranium, which is flattened by the slight pressure of a soft pillow. This asymmetry is liable to disappear after recovery, except in grave cases.

The local hyperamia and excessive occipital heat forbid the use of warm bonnets and feather pillows. A soft hair pillow must be so arranged that the head, together with the body, can be comfortably carried without any pressure. Elsaciser (1843) recommended a pillow with a central depression or perforation; a small air-cushion filled to one-third of its capacity is very acceptable. Consecutive brain symptoms require appropriate treatment. Great convulsibility demands bromides, chloral, and mild opiates, which are well tolerated in this condition. The perspiration requires cooling with water, or

water and vinegar, or powdering with one part of salicylic acid mixed with ten parts of rinc oxide and twenty-five of starch. The general treatment of rhachins improves this local cranial symptom, which is quite serious. In former years I was in the fiabit of giving a good prognosis, prayided the next six or eight weeks passed without fatal symptoms (convulsions, etc.). That period was generally sufficient to so change both the general autrition and the local condition as to restore a fair average of health holds in the cranium and as contents. The experience of late years has shortened this period. What I suggested in a brief paper on the use of phosphorus in the treatment of chronic and subscene diseases of the bones in the Trasuactions of the Medical Society of the State of New York, of 1880. and in a paper on amemia in infancy and childhood read before the Medical Society of the County of New York in 1880 (Arch of Med., February, 1881), has proved a great success in other bands, For it is to Kassoscitz that the credit of the introduction of phosphorus as the principal remedy in rhadrats is mainly due. When, thirty years ago, C. Wegner fractured the bones of rabbits and fed the animals on minute doses of phosphorus, he found that these hones would beal in a much shorter time than those which were not so appolied. This observation induced me to employ the drug in all cases of (mostly inherculous) subarnite and chronic ostritis, Port's disease, and caries of the tarsus; and a great many cases led me to conclude that recovery was more readily accomplished under this treatment. Phosphorus is, by virtue of its irritating effect, when given in small doses, a tissue-builder (Kassowitz asserts that it impedes the formation of blood-vessels), when in large doses, a tissuedestroyer. In the former it in part acts through the rapid development of connective tissue, similarly to what Lannelongue expects to artain by the local injections of zinc chloride solutions near tubercular joints. Thus I became convinced of its tissue-building properties in other parts also. I may mention here, before I have an opportunity to return to the subject in extense, that I have availed myself of this quality of phosphorus for other purposes. It has served me well in many ominous cases of purpura and similar processes, in which a congenital or acquired ill nutrition of the bloodvessel walls results in habitual hemorrhages.

Kassowite's results with the use of phosphorus in rhachitis are generally good. The cases in which it has rendered me its best services are exactly those alluded to, of craniotabes. A very few weeks suffice to change the condition of the cranial bones considerably; the softened parts become smaller and harder and the consentite symptoms midder. It is of equal value in acute rhachitis, with its extensive acute epiphysitis, rapid pulse, diarrhoxa, general feebleness, and (frequently) some symptoms of scurvy.

The desc of phosphorus in these cases is from one-third to onehalf of a milligramme three times or twice a day. The oleum phosphoratum of the U. S. Pharmacoperia contains one part of phosphorus in ten parts of ether and ninety of oil. Its daily dose is from two to three minims. Concentrated oil solutions are liable to decompose "Thomson's solution" keeps fairly well, but the best preparation is the elixir of phosphorus of the U. S. Pharmacopeia, composed of 210 parts of the spirit of phosphorus, 2 parts of oil of unise, 550 parts of glycerin, and a sufficient quantity of aromatic elixir. to make 1000 parts. Of this clixir a teaspoonful contains one milligramme of phosphorus, and a dose, to be repeated three times a day, is from six to fifteen minims. No temptation ought to be strong enough to employ phosphates, which will invariably reappear both in the wrine and in the faces. It seems probable, moreover, that the phosphates when contained in nutriment are more digestible and more assimilable than when given as a medicine, but only when given in organic combination like that in which they are in human but not in cow's milk, which has much more of it, but in an insoluble and mabsorbable condition. It is probable that the preparation of cow's milk with hydrocliforic acid (p. 34) will keep lime in better solution. Its place may even be taken by extra doses of sodium chloride, with its tendency to change into hydrochloric acid (p. 14). It is worth while here to refer to the observation of E. Pfeiffer, who found that the breast-milk of mothers who had rhachitic infants contained only 6.4 per cent, of chloride of time (altogether less time than normal), and of Zweifel, who reports that nearly all the infants in workingmen's families were rhachitic for the reason that the bread (in Saxony) is made without salt, and that on that account nursing women had less than the normal quantity of salt in their milk. Another plea for the copious use of salt! Phosphates are much inferior in effect to the hypophosphites of the Pharmacopeia with or without iron. Phosphorus given simultaneously with cod-liver oil is a good combination, but it is a doubtful practice, so long as the latter is not a uniform compound, to dissolve phosphorus in the vil. No danger need be feared from the administration of phosphorus, for the doses are small and may be continued a long time. Indeed, phosphorus poisoning is not observed in the lower oxidations and not in organic combinations. When animia is intense, the perparations of iron are required. Besides the above, the syrunof the axlide of fron may be given, as many drops three times a day as the baby is months old, or from ten to twenty-five drops three times a day to children of from one to two or three years. When the spleen and also the lumph-bodies are very large, three daily doses of from one-half to one drop of Fowler's solution are beneficial. In scoedutic cases or complications, fruit-juices are required. Henbuer's experience with phosphorus in bad bospital cases is negative. The famous teacher knows, however, that had rhachitis never does well in hospitals. If it requires anything, it is air, air, and again air! To his disconfiture, however, we owe some observations which, though they be negative, are valuable. Guided by what he takes to be a fact, that all irritations and inflammations from known causes are local, and by Lanz, who finds certain relations between the thyroid and bone development, and suggests a trial of thyroid in rhaditis, be gave from one-half to one decigramme of Merck's thyroidin every other day, or every day, with a negative result so far as improvement of rhachitis was concerned; with a favorable effect, however, he believed, on the general condition of the child-

Laryngistens stridishe, the prowing aspiration of infants, is almost always connected with cramotabes, and caused by its meningral and encephalic results. It consists of two stages, the first of which is that of paralytic appear, the second of a long-drawn and loud inspiration through the spastically contracted glottis. The causal treatment is that of rhachitis in general, of cranial rhachitis in purticular. Before, however, it can accomplish a permanent effect the single attacks of, and the general tendency to, laryngismus require attention. For any attack may prove fatal, though the assertion of Vogel, who expresses the opinion that most cases of laryngismus are fatal, is grossly exaggerated, in my opinion, which has not changed in this respect since my interances in 1871." Besides phosphorus, syrup of the iodide of iron, and other treatment, constinution requires more than the usual attention, for the nerve-equilibrium is easily disturbed by a slight irregularity in any of the organic functions. To soothe its general subscrability the regular administration of the bromides (twelve or fifteen grains daily of a mixture of potassium. sodium, and ammonium salts) or of a few grains daily of zine valeriamate is indicated. Many cases bear one-south of a gram of codeing in the twenty-four hours. These cases of excessive irritability are quite precarious. In them the cars require particular attention, for the slightest (external or) internal otitis is hable to produce con-

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valsions. In them even the lancing of gums, when there is but a suspicion of local pruritus, may become pardonable. The attack can be cut short by shaking the infant, or slapping the face with a cloth dipped in water, or using the spark of a Leyden flask (for there is no time for the administration of the interrupted current). General convolutous, which are not uncommon after an attack, require the inhalation of chloroform or the rectal injection of from four to eight grains of chloral hydrate.

The rhachitical disorders of the respiratory argums own their origin to several causes. In rhachitis the heart is of average size, but the arteries are abnormally large. Great width of arteries lowers the blood-pressure. That is why the muscles and bones suffer from insufficient nutrition, and who the circulation in the respiratory organs is slow and sluggish, with a tendency to produce congestion and catarris. Other causes of the chronic bronchial catarri of the rhachitic infant, which is so ant to become beoughitis and terminate in broncho-pneumonia, depend upon the smallness, particularly of the lower half, of the contracted chest, which compresses the lungs and the heart, mainly when the elliptic shape of the chest is changed into the quadrangular or triangular; and the tumefaction of tracheal, broughial, and mediastinal fymph-bodies, which are in close lymph communication with the bronchial mucous membranes. There are but lew thoroughly developed cases of rhachitis, when complicated with becachitis, without them. Not infrequently some of them can be felt in the supractavicular spaces; more commonly they can be percussed behind and to the left of the mounthrims sterra, the dulases of which is in many cases but partly thymic. Sometimes they are discovered by percussion of the infractavicular region of the (right or more frequently the) left side and often on the left side of the intrascapular region. These glandular swellings, which point to and explain the frequent relations of rhachitis, scrofula, and tuberculosis with one another, are not uncommon appearances in the antopsies of rhachitical babies who finally died of the last developments of their chronic estarrh.

This tendency to glandelar swellings requires early attention. It is here that cod-liver oil and the syrup of the iodide of iron are

[&]quot;There are occasionally other cason, independent or contributing, of largingians which may be mentioned here,—viz., unlarged thomas, swelled beauchial glands, admiceds, and extra-cerebral serve disturbances (inferior largegeal), the latter two monthly depending on one or both of the first named. They have their own indications, but will hardly ever be found without reaching.

mainly serviceable. In many cases the addition of half a minus of Fowler's solution, administered three times a day, proves beneficial. This is the condition of things in which cold sponging, salt-water bathing, and salt air are particularly beneficial. Out-door life must be insisted upon, and there are but few reasons—mostly of a local character—which fortid such babies to enjoy fresh air at all hours of the day and night.

Subacute or acute inflammations of the respiratory organs, when they have made their appearance during the chronic rhachitic catarrh, require, besides the usual rational treatment, some additional measures. More care than in an average case of the otherwise healthy most be taken lest the faltering strength be exhausted before the acute disease has had time to run its course. The singgish circulation, depending on general debility and the large size of the arteries, demands the administration of heart tonics—digitalis, strophanthus, sparteine, caffeine, or coffee—from the very beginning, and besides small doses of alcoholic stimulants at an early stage or the nee of stimulant expectorants, such as ammonium carbonate or campbor. There is a positive contraindication to antimonials and squill; even ipecae must be avoided because of its possibly depressing effect.

Rhachitic constitution is mostly due to the incompetency of the muscular layers of the intestine and of the abdominal wall. Thus purgatives must be avoided in its treatment, with the exception of those cases in which the accumulation of faces in the bowels is attended by serious consequences. In these an occasional dose of calourel will act both as a laxative and a disinfectant. When an acid gastric catarrh accompanies the intestinal weakness, calcined maguesia in doses of a grain, given on an empty stomach or before meals (never after), repeated several times dails, will neutralize the almormal acidity of the stormelt and also open the bowels. A daily enema of tepid water continued for mombs will mostly suffice to alleviate the troublesome symptom. Cod-liver oil, while being administered on account of the general indications, has also a beneficial local effect. Pure cou's milk is more contraindicated in this condition then in almost any other. Artificial food should contain a copious addition of salt and sugar, and outmeal rather than barley. Gentle massage of the abdomen, and strychnine, one-two-hundredth of a grain, two or three times a day, improve the muscular strength. The sympof the lodide of iron, in three daily doses of a few drops, and the regular administration of beef preparations, will improve constipation with the other symptoms, particularly when this treatment is commenced at an early period. For it is at an early period, generally in the second or third worth, that this rhachitic constipation makes its first appearance. It is one of the first symptoms of protracted rhachitis, and is diagnosticated from what I have described as congenital constipation—which depends on the abnormal length of the sigmoid flexure—by the fact that the latter begins at birth.

3. Serofulosis (Serofula).

The discrimination between scrofula and tuberculosis is attended by no difficulty for those who claim the bacillus of Koch as the pathognomonic essence of the latter. For all others-and so it was before the period of the bacillus-the distinction may not be quite so easy; at all events, the boundary lines between scroinla and tuberculosis are not always quite marked. But it is certain that the bacillus need not be present in the former so long as it remains uncomplicated. To diagnosticate "tuberculosis" when the lymph-bodies of the neck swell from below upward, and "scrofulosis" when from above downward, is a wanton postniation, for the mucous membranes of the nose and throat are as pervious to bacilli as that of the brouchi. The skin, mucous membranes, and lymph-ducts of the very young are very pervious, and access to and through them quite easy both to harilli and to cocci. It is particularly the lymph-apparatus that is affected by scrofula. Even in the adult the lymph-bodies, with their copious cell-formation, retain an embryonal character, the lymphvessels are numerous and large, and the lymph-current very energetic. A fistula of the thoracic duct in a young dog furnished lymph that equalled one-tenth or one-sixth part of its body weight, in a grown-up dog one-twelfth or one-sixteenth part.

We speak of scrofula in persons who exhibit a great tendency, with no apparent, or upon the slightest, provocation, to inbacute or chronic inflammation of most tissues, mainly the cutis and mucous membranes, sensory organs, glands, bones, and joints. It is characteristic of scrofula, in its incipioney, to be wide-spread; of tuberculosis, however, in the tast majority of cases, to be localized. One or more localities in which scrofulosis is noticed may become the seat of tuberculosis, for hacilli will find a resting-place in softened tissue with slow circulation. These inflammations are persistent and liable to return; they run their course with both rapid formation and disintegration of the cells, equally in the "erethic" and "torpid" forms. Of these, the former is recognized by a frail and thin form, delicate features, great intellect, blue selerotic, and large pupils; the latter, by a coarse and expressionless face, ordenatous lips and nose,

congested eyes, large abdomen, swollen glands, and frequent entaneous eruptions.

It is the commendation of modern therapeuties to be mostly prepenaltice. So is the treatment of scrofula. Many cases of the disorder would not appear if our modes of thinking and feeling, our habits and laws, were not the immediate results of individual egotism So long as the welfare of the commonwealth, both present and future. does not supervole, in the convictions of the many, the dictates of selfishness, there will be no restriction of the marriages of the scrofulous, syphilitie, and tuberculous, and the propagation and proliferation of their dangerous ailments. If mankind of the future means to be healthy and happy, there must be found some mode of preventing hereditary influences from having full sway. We are not Spartana, who kill the unhealthy newly-born, but we are to develop into men who pity those laden by their parents with the eternal curse of illness, and citizens who feel responsible for the physical and intellectual welfare of the community. In the United States arrofula has been on the increase at a rapid pace since the immigration of the most abject specimens of the most abject peoples of the Old World has been allowed to swell our numbers by the hundreds of thousands for each of the last two dozen years.

An important preventive measure is the suppression of the attacks of acute diseases in children, mainly the eruptive fevers. It is urgent always to emphasize the necessity of medical (hygienic and pharmacentical) treatment of most cases of sickness. Measles and scarlatina are particularly liable to interfere with the subsequent normal development,—the former through its influence on the respiratory, the latter through its effect on the digestive and lymphatic systems, and also on the bones. The modifications of a severe form into a milder form and the early restitution of the physical functions to a normal standard are gains for life.

Scrofula being frequently the direct effect of digestive disorders, resulting either from improper food or matriment improperly given or insufficiently digested, the greatest care is to be bestowed on both food and the digestive organs. This is of more than the average importance in regard to the offspring of tuberculous parents. No tuberculous mother should nurse her own infant. The selection of the wet-nurse should be the most painetaking, and the period and mode of weaning must be supervised with the utmost care. Afterwards amylacous food, particularly potatoes, should be aroided or given in small quantities only. Good milk (boiled), cereals, and meat, with the addition of fruit, ought to be the principal food of children

up to their tenth or twelfth year. Stimulants must not be given except on proper and exceptional indications; thus tea, coffee, alcohol, stimulating beverages of any kind, are forbidden articles of diet. Cocca must take the place of chocolate. The best beverage is water, it supplies every want, and when taken in sufficient quantities is the best stimulant of tissue metamorphosis. In the very rare cases in which a sensitive stomach does not bear it well a carbonated or (and) slightly affealine water will take its place.

Among the additional foods, cod-fiver oil ranks high. Most children take it readily after a short time, and are anxious to have it. Thus there was no necessity for peptonizing, emulsionizing, or "hydrolemating" from the point of view of the children or of practice. Of the reprehensibility of filling the child's digestive organs with unlimited lime I have spoken in another place. The oil can be taken through successive years. Its administration ought to be interrupted during warm days and during the summer. Still, there are those who bear it well all the time. Fat children do better without it. In disorders of the stomach, and while the appetite is bad, also during a feverish disease of any kind, also during a diarrison, it must not be given (p. 8).

Preparations of malt may be administered to advantage in small quantities several times daily. It is self-understood that the multitude of mult preparations containing medicines will be left by the intelligent practitioner on the shelves of the corner pharmacy.

Tea of walnut leaves was a universal remedy in scrofulous affections when tastes were simpler, modicines less in number, and lessmoney was invested in expensive articles. Among the poor and in country districts it will prove an admirable adjuvant.

Among medicinal preparations those of iron and softwe have met with most praise. The indications for the administration of the former are those of anemia. When this is marked, iron ought to be given, and continued for a long period, according to the principles and methods haid down in a previous chapter. Potassium and sodium isolides and the tineture of iodine have been used. In the "erethic" form of scrofula they may do harm, and ought to be avoided. The same warning holds good in reference to those chillien who suffer from frequent attacks of bronchitis, which may already be the precursor or accompanionent of pulmonary tuberculosis. A sensitive stomach will not bear iodides. They may be made more digestible by the addition of a bitter tonic, and particularly by a few drops of tinerure of nux vomica, diluted, with each dose. When the notible results in bringing on the disagreeable or dangerous symptoms

of lodism, the addition of potassium chlorate to the torbde, in doses of from ten to twenty grains daily, according to age, will prove beneficial. The potassium (or sodium) lodide may be taken in five- or six-grain doses, daily, by a child of two years, fifteen grains at ten years, for a long period. The sodium is better tolerated, as a rule. The tineture must not be administered in more than one-strop doses, three times a day. The syrap of hydriodic acid is often tolerated better than the previous preparations (from two to four cubic centimetres = one-half to one drachm daily); of iodipin, which contains ten per cent of iodine, a teaspoonful may be given daily (= seven grains of potassium iodide). The syrap of the iodide of iron is a valuable preparation, to be given three times a day in doses varying from three to twenty drops. So is the saccharated iodide of iron in three daily doses of from two to five centigrammes (gr. 3) to 34).

The indications for the use of iodine in general are also valid for that of the mineral springs containing that element, such as St. Catherine or Kreuenach. Fat children and those with sedemators swellings, glandular infiltrations, or the expolations resulting from scrotulous inflammations are mostly benefited by them.

Of phosphorus, as a tissue-builder in subscute and chronic inflammations of the bones, I have spoken in another connection (p. (30). Its property as a stimulant of growth in general I have often verified in many morbid conditions. Scrofnlous tissues, with their rapid decay and new formation, exhibit indeed the type of subacute inflammation, with the peculiar characteristic of rapid cellproliferation, which perishes speedily because it is not sustained by a healthy connective tissue. The latter is formed by the internal administration of minute doses of phosphorus, such as I recommended for the above indications. Thus I refer to the remarks (made previously on the subject) on the doses in which the drug is to be given. the period during which it is to be continued, and the impossibility of substituting for it any of its salts. Those who do not pin their faith on the treatment of any disease on any single remedy, but combine remedial measures with the proper regard to hygiene, will not be mistaken in their expectations of the effects of phosphorus in the treatment of scrofulous disorder. I have used arsenic for the same purposes and on the strength of the same indications, but it has appeared to me to offer less advantages in these conditions.

A very active treatment can and should be applied to the fymph bodies. Their tumefaction may be prevented in most cases. They swell under the influence of an irritation in the neighborhood. An intestinal catarrh will congest the neighboring mesenteric lymphbedies; within a few days they become enlarged and hyperamic. When the local catarrh continues the hyperamia will result in hyperplasia, and no long period is required to so change the tissue as to render the induration unabsorbable. If the diarrhosa " of the second summer," or of "teething," had not been permitted to go unchecked, these "scrofulous" glands would never have existed and therefore never interfered with lymph circulation and nutrition. Or the caries of a tooth, or a nasal catarrh, or a facial eczenia, or one of the scalp is allowed to continue and develop into a chronic condition, and the secondary swelling of the glands round the throat and neck is the nevitable result. Principla obsta. The greatest and gravest consequences might easily be prevented by attending to their trifling causes. Keep the nucous membranes healthy and the neighboring lymph-hodies will not be infected.

When the lymph-bodies have had time to undergo indutation, an attempt should be made at reducing them, though they be ever so hard or large. The frequent immetion of potassium is dide contment made with landin will often carry the point; so will that of green soap. Which preparations ought to be used, and to what extent the remedy, to what the massage of the parts alone is effective, are left to the decision of the practitioner. At the same time the syrup of the iodide of iron may be administered internally.

When these measures have proved inefficient after a reasonable time, the indurated lymph-bodies should be removed. The operation is not always easy, but recovery is almost certain, and the protection afforded by it more than pays for every exertion on the part of the medical man and the temporary annoyance on that of the patient. When an abscess forms in the centre of a lymph-body, it should be enucleated. If it rupture, all the remaining parts of the lymph-body should be scraped out, disinfected, and made to heal. Sinuses should be laid open and the surface scraped off and treated with todoform in oil or in glycerin (1 to 8 or 12) once every few days. A mild solution of dioxide may also be used a few times, or powdered sinc hyperoxide, or the same in an emulsion of ten per cent.

Diseased hones should be treated on similar principles. Unless a scrofulous osteitis be superficial and within easy reach, the diseased parts ought to be removed with the least possible delay. The number of cases recovering, though after a long time, and sometimes with shartered general health, without an operation, affords no excuse for those which have been permitted to develop into caries, or necrosis, or pyamia, or lencoesthrenia, or tuberculosis.

Scrobulous conjunctivitis, keratitis, etitis, eczema, and arthritis

should be treated internally and to combat the morbid disposition, besides the procedures and appliances taught in subsequent chapters.

That the scrofulous condition requires good air and ventilation may be mentioned, though it hardly appears necessary to do so. The children ought to be kept in the open air constantly. For that purpose the winters should be passed, if circumstances permit, in warmer climates. From that point of view the summer sea-sanitaria of our large cities and the similar institutions of the civilized countries of Europe have rendered valuable services.

The skin of a scrofulous child must be kept scrapulously clean. But water must do more than merely that: the child must get used to cold water, and thereby accustomed to changes of temperatures. At the same time its nervous system will be strengthened and mentaneous and cardiac circulation stimulated. The principles laid down in connection with the bathing of the very young hold good here, and I refer to my remarks on the subject. Saft water is preferable to plain water, and sca-bathing to either. Only in the cases of those who suffer greatly from externs and other scrofulous eruptions water must be avoided as long as the surface is not relieved. Indeed, no irritation of the surface is tolerated. Thus a scrofulous skin ought to be spared adhesive plasters or vesicatories, though the indications for their use be ever so tempting.

Incidental diseases of scrofulous children require more than the usual care. The perishable character of all their tissues renders an average febrile or inflammatory disease uncommonly dangerous. Unexpected deaths are frequently met with in such cases. In them the avoidance of strong purgatives or depletions is the first commandment; in them early feeding and sufficient general stimulation are among the principal indications; in them cardiac tonics, given timely and plentifully, will save many a life that would otherwise succomb.

4. Lymphatismi

A number of infants and children exhibit a peruliar pallor, coupled with adiposity and rhachitical symptoms. I have alluded to this form of thachitis repeatedly during many years. These patients, always pale and flabby, show a singular general debility. The largegismus found in such children, with or without sudden death, like the other symptoms, glandular swellings, etc., I mostly attributed to this form of rhachitis; probably correctly, at least in many or most instances. Maybe others should be explained differently.

The so-called "lymphatic state" is a condition of pallor, adiposity, hyperamia, but otherwise normal structure of most organs, rather

large (sometimes very large) spleen, thymus, and also thyroid, thachitic epiphysitis, swelling (in different degrees) of the lymph-hodies of the neck, axillie, mesentery, of the tonsils and the follicles of the mao-pluryux, and of the tongue. This condition is also compicated with hypoplasia of the (heart and) arteries (Virchow, different from actual rhachitis, in which the arteries are rather large), which explains many a case of chlorosis and also of hemophilia, sometimes with infantilism of the sexual organs, buirless pulses, and lymphocytosis. Sudden deaths seem frequently to be due to this condition, or rather to the excessive weakness of the heart connected with it (Paltani, Escherich, J. Ewing). The heart being much, chloroform inhalation, otherwise preferable to ether in children, becomes dangerous. Escherich tried the effect of calf-thyrms feeding in this complex ailment, with negative result. Besides general antirinchitic treatment, I should feel like relying mainly on phosphorus and cereal and animal foods. Lymphatic children in whom the above symptoms may be feared can be protected by moderate doses of bromides or a few thilly doses of ten or fifteen drops of tincture of music. Iron preparations should be used carefully (ferratin, the albuminate, or the peptomate).

In some cases of general liposistosis of children of both sexes was struck with the smallness of their radial and carotid arteries and their feeble heart-heats. The percussion of the heart yields very suestionable results, on account of the thickness of the chestwalls. Still, these were never so thick as to prevent the percussion of the thymns behind the manubrium stemi. In several instances it was found to be large, even in patients of ten and twelve years. In every one of its varieties, lipomatosis, being general, is a serious danger in any intervening disease. All the organs, mainly the heart. being liable to be incompetent, stimulants and rehorants should be given through the whole course of feverish diseases intervening in excessively adipose children. Intertrigo is very common and obstitate. Adiposity of the nurslings is not a pleasant symptom, and the increase of their weight, generally claimed as a proof of good bealth and of thriving, is rather deceptive. Unless it be excessive, however, it will disappear about and after the end of the first year when muscles develop more effectually. As a rule, their blood is defective in erathrocytes and in homoglobin. The fat babies of fat mothers should be assumed or crreats and animal food should be added to breast-milk: perhaps lodide of iron gives.

The diet should be principally albuminous, with a fair amount of fat, very little vegetable carbohydrates, and little water. General massage, exercise, for a while sodium sulphate every morning, and iodide of iron are helpful. Thyroid may safely be given, with some caution and combined with a cardiac stimulant (strychnine), to advantage. In hydraemic arcamia also, with or without a slight enlargement of the thyroid, and in marked simple anaemias, with or without calarged splern, besides liponeriosis, thyroid (as recommended by N. Koplik, Arch. of Ped., July, 1897) should be tried in combination with the treatment detailed above.

3. Diseases of the Practices Glands.

Their "internal secretion" is required in the organic commy either as an additional element or for the purpose of destroying the toxic results of metabolism.

Psendoplasms of the thyroid gland are not often observed in infancy and childhood; still, even carcinoma and inforculosis have been noticed. Syphilatic gammens have been found, and would, if diagnosticated, demand specific treatment. A dermoid namor was removed from an infant two hours old, who recovered (London Lawy). May 22, 1807). Atrophy with mysurfessa has been reported in a girl of twelve years; its treatment consisted in the administration of theroid gland. Information has been known to follow trauma and infectious or common catarrh of the nose and miso-pharynx. The treatment should consist of local applications of ice, bydrotherapeutic measures in general, saline purgatives, irrigations (both cleansing and antiseptic) of the narcs and pharynx, and perhaps isdine both internally and externally, when absorption is slow. Suppuration requires early incision. Goitre-struma-is mostly met with in the lateral lobes, and therefore is not liable to annoy respiration until it becomes very large; should it do so, it compresses, particularly school behind the stermin, the traches, vessels, and nerves. The noral forms found in the adult (lymplatic, cystic, even colloid and fibrous) are observed. When congenital, it is apt to be absorbed unless it be syphilitic and in need of mercurial combined with todine treatment; the age of puberty also predisposes to spontaneous decrease. Most cases presented were in children from seven to ten years old. An occasional pulsation is not, of itself, pathognomonic of Graves's diseaso. An epidemic-infectious and contagious-form of goitre has been observed in schools, but was only a temporary ailment. Tincture of iodine, strong or modified, may be applied once every few days, or potassium iodide in glycerin (1 to 2 or 8), or a potassium iodide ointment with basolin (1 to 4 or 10) may be rubbed in several times daily. Potassium iodide may be given in doses of from fire to fiftees

grains stally. Iodine, indeed, appears to have, in factoric and in stryroid poisoning, antitoxic properties, the toxalbumin of the thyroid having a great affinity to iodine. With potassium iodide injections into the tissue of the enlarged gland I have had no experience. In simple hypertrophic gottre and diffuse colloid degeneration injections (as many as fifteen) have been made every other day or every third day, with effect beginning to show itself after the sixth or seventh, of iodoform one, other and olive oil each seven parts, the dose to be one or two cubic continuetres (mm. xv or xxx). The cystic form requires puncture with injection of Lugol's solution; if the secondary swelling he too large and annoying, see should be applied. Or the cyst or cysts may be incised and tamponed with asceptic gause. If extirgation be preferred, it must not be total, because of the consecutive occurrence of cachexia stramipriva, betany, and mysosdema.

Extirpation has the same effect as that observed in cases of absence or of degeneration of the thyroid gland. This degeneration may lead to atrophy or to an apparent hypertrophy: that is only thickness of the thyroid should not be taken for normal tissue. Myradesot (mainly characterized by that condition of the thyroid, by the peculiar myxomatous structure of the skin and subcutaneous tissue, and by mental failure) is soon in the young as well as in the adult. In the young it is mostly complicated with cretision of semi-cretinism; in many cases the absence or degeneration of the thyroid may be its only cause, in many others it exhibits at the same time changes in the skeleton, prominent among which is the shortening of the cranial base produced by the premature ossification of the latter, the cretinism of the focus and of the infant and the myxordems of the soung and of the adult are results of the same anomaly.

This cretinian is by no means so rare among us as it has been reputed to be even by the best observers. The patients, with their thick, short neck, clumsy looking head, retracted root of nose, wife-apart eyelcalls, thick lips and tongue outside the treth, large abdomen, dwarfed stature, and indolence, seldom appear in practice. They are occasionally found in the retreats of the tenement-houses, where the general practitioner may happen to see them, though he be not consulted about them; only of late they turn up in the dispensaries.

In the therapeuties of cretatism in most of its forms the thyroid gland, in its various preparations, has worked a beneficial revolution, as it also has in that of myxordema. This addition to our facilities for overcoming a formerly incurable silment, at least to a certain

extent (for no perfect recovery is known as yet), is, as Meltzer has so well shown (New York Med. Monatsackrift, May, 1895), emineatly due to biological experiment and to it only. There are but few cases that resist its efficacy. The doses, however, must be small, particularly in the beginning: from one-third of a grain to one grain of Parke. Davis & Co.'s powdered thyroid three times a day, the small dose first, the larger one afterwards, are all that ought to be given an infant or child, according to age. The treatment must be continued a long time. It cannot be expected to act so well as in the myssedems. of the adult, because the crytinism or semi-crytinism of the child in the result of an arrest of development at a very early period of intrauterine life. It follows that the treatment ought to begin as early as the diagnosis can be made. Besides the powder of Parks, Davis & Co., I know only Armour's preparation and the tablets of Burroughs and Wellcome. They are not of equal strength, and in every case ought to be commenced in small doses; for sometimes even apparently small doses produce general and cardiac irritation, palpitation, tremor, debility, and diarrhora. On the other hand, rather large dwee may be required. In a cretin six years old, so hospital treatment, I was obliged to increase the doses from one and one-half grams (0.1) daily to thirty-six (1) grains (2.5), which were taken a number of days before the pulse became more frequent, mild perspiration and restlessness showed themselves, and the temperature rose slightly. The general improvement was rapid. Other effects of the thyroid medication are obtainable in the child as in the adult. Myxxedema, the near relative of cretinism, shows its main symptoms in the subcutaneous tissue and in the skin, which are thickened and hard, and in the nervous system. I have seen good results of the thyroid treatment in cases of excessive adiposity,-one hoy of eleven years, weighing one hundred and fifty pounds, was reduced to one buildred and twenty in four months under the use of small doses,in selectederms, and in a case of psoriasis. Fortunately, such cases are rare. Moreover, the thyroid treatment has proved very efficient in instances of stunted growth in the child and adolescent, with or without stunted intelligence. The effect was several times quite astonishing, both the length of the body and its general condition being rapidly improved.

The attempts at isolating the active principle, either organic in probably chemical, have proved successful in a good many cases that indicated thyroid medication. The dose of indethyris is like that of the thyroid substance. Its disagreeable effects may be modified by the use of arsenic. Burroughs-Wellcome's thyroidise, sold in tallets (d 0.25 (four grains), may be given in similar doses. Asodim another thyroid preparation, is recommended in the same way. It is claimed to contain 0.4 per cent, of iodine, and is therefore warmly recommended in the treatment of scrofulous lymph-bodies. The thyroantitoxin of Fraenkel is recommended in doses (to an adult) of one contigramme (one-sixth grain), five or six of which may be given daily.

Not infrequently I have combined arsenic or phosphorus with the thyroid, some of the cases of cretinism showing characteristic symptoms of rickets. Indeed, the condition of the base of the skull appears to be one of the manifestations of localized rhachitis which has completed its entire course before birth.

The lasting effect of thyroid administration is rather jeopardized by the necessity of persisting in the treatment in order to escape relapses. Horsley's attempts at transplanting glandular substance will have to be repeated until they are successful and place the effect of the minuculous therapy beyond any risk. Such risks exist. The effect, sometimes of small doses, may be distressing,—prurigo, perspiration, tachycardia, delirium, even tonic spasms, and undesirable loss of weight; glycosuria rarely. In all these symptoms the effects of the treatment resemble very much those of exophthalmic goitre (Gravea's or Basedow's disease), in which the thyroid is enlarged and in all probability the seat of abnormal functions.

Exophthalmic goilre is not a frequent disease in childhood. Of twelve cases reported in literature until 1879, four were mine (New Fork Medical Record, July 5, 1879); they occurred in children of from nine to thirteen years. Nor are the symptoms so grave as they are liable to be in the adult; in many, not all of the three alterations (exophthalmos, gottre, and tachycardia) are found at the same time. In the treatment proper regard must be paid to diet and hygiene. No excitement, fear, work, stimulants. Prolonged or but partial rest in bed at home or in a hospital. Baths of moderate temperature. Toe to the leart and (or) to the goitre for days, or hours, in succession. Application once or twice daily of a mild galvanic current (negative pole, from one to three milliampères) from five to ten minutes over the sympathetic nerve, between the born of the hyoid bone and the sterno-rivido-mustoid muscle. Digitalis and strophanthus act badly, and are apt to increase tachycardia; potassium iodide acts more favorably. Govern recommends belladorna in rising doses. My most successful medicinal treatment has been with arsenous acid, from two to six milligrammes (one-thirtieth to one-tenth grain), atroping from one-third of a milligramme to one milligramme (one-one-hundredand eightieth to one-sixtieth grain), and fluid extract of ergot a gramme (fifteen grains) or more daily. I lately had a child's case under observation for some time, and was favorably impressed with the effect of thyroid in that case. Possibly it acts better in children, in whom the course of the disease is mostly milder; for, so far as adults are concerned, experience does not seem to be favorable. It is quite possible that Graves's disease will be much more influenced by the administration of thymns gland. Reinbarh found fresh thymns to act in cases of goitre in which thyroid treatment had proved ineffective. The direct dependence of Graves's disease on the condition of the thyroid glands appears to be proven by the result of operations (partial removal), which, according to Oppenheimer, enred eighteen and improved twenty-six out of sixty-six cases. Nine fied within a day after the operation. Of late the results of operations are greatly better; Kimmell, for instance, operated on fourteen severe. cases of exophthalmic goitre with partial removal of the thyroid gland; twelve were permanently cured. The report was made from two to seven years after the operation. The remaining part of the gland showed a tendency to shrink; in one case only it grew a little larger. The other two cases were cared, with the exception of the exceptthalmos, which persisted at first, but gradually diminished in size (Berl, Klinsk, June, 1897). Dosen reported two equally successful cases (Sens. Med., 1897, p. 280). Sorgo collisted 174 cases of strumectomy performed on adults who had Graves's disease; recovery took place in all considerable improvement in 27, moderate improvement in 62, no improvement in 11, death in 24 soon after the operation. Mikulicz arrives at the following conclusions: after a partial removal of the thyroid the first symptoms to disappear are the nervous and psychic, techycardia takes more time, exophthalmos disappears late or not at all. Resection of the sympathetic about the neck laslately been recommended (Jonnesco), total and bilateral, inclusive of the inferior cervical ganglion.

Favorable results of the thyroid treatment have been mentioned in regard to dwarf growth and psoriasis. Further mention should be made of prurigo, of aeromegaly, and of hyperplastic offits interna in young obese persons. The absence of the thyroid function certainly retards the growth of bones, while it seems to leave intact the large abdominal viscera. It has sometimes improved tetany and certainly has a very favorable effect in simple hyperplastic goitre, in which the normal structure of the gland has been destroyed.

Diseases of the thyrous gland are not yet very amenable to treatment. Inflammations, abscesses, syphilis, tuberculosis, sarconta-

Igniphadenoms, carcinoma, hemorrhage, and sclerosis have been observed. Its physiological dignity in the factus and young infant is certainly great. Nearly half a century ago Friedleben proved that it is indispensable in the foctal and infant economy. It is largest (normally) from the third to the twentieth month; about the minth month it was found, in unusual instances, from 1.5 to two centimetres in thickness. As the distance between the manubrium sterni and the vertebral column is but two centimetres about the eighth month of life, the slightest increase of an enlarged thymns through disturbed circulation, by crying or otherwise, may prove suddenly fatal; for besides the thymns, the osophagus, the traches, the blood-vessels, and the sympathetic and pneumogastric nerves are located in that narrow space. Bending the head backward during trachectomy proved fatal. Swelling of the thymns in a cold both may be dangerous.

Another danger is the irritation of the recurrent nerve by the constant up-and-down movement of the thymns gland. In such a case thath may occur. It is cardiac, for at the antopsies there was no injection of the pia mater and no suggiflations in the lengs.

Keenig (1897, after Relin, 1896) extirpated a part of the thymns of an infant of nine weeks that suffered from intense dyspinea. The remaining part he attached to the manuforium sterni and the tendons of the sterno-cleido-mastoid muscles; recovery was complete in four weeks. Thus, local pressure or irritation by the greatly enlarged gland may prove fatal, though most cases of sudden death in largugismus stridulus must be explained otherwise. A recent case of death from large thymns occurred nine hours after birth (Schleid).

Like the thyroid, the thymus was found enlarged in many; according to Eth in all, cases of acromogaly.

Acromegaly—enlargement of all the tissues (except the skin) of lunds and feet, of both maxiller, with alveolar processes, so that the base of the face is below (while it is above in Paget's ostritis deformans, and the shape of the face is round in myxeedema), of cars, of tongue, and thorax, now and then hereditary, multiple in families, occasionally with disorders of the pancreas, in the adult with early arteriosclerosis, with deformity of the chest and enlarged viscera, selfom with glycosuma—was attributed by Marie to hyperfunction of the hypophysis (pituitary gland), which is in part a secreting organ without a duct, so that the lymph-vessels carry off the secretion Marie, therefore, looks upon acromegaly (and many cases of gigantic growth: several professional giants were found to be acromegalic) as a matritive disorder connected with an anomalous hypophysis, as myxeedema is with the thyroid gland. Possibly, as the thymus ap-

pears to be affected, acromegaly is the result of the complex anomalies of several organs. The treatment with hypophysis gave no conclusive results; nor that with thymns. The latter was also employed by Macalister in pseudo-hypertrophy, and by Mikulicz in goitre and Graves's disease; in the latter it has also been used by Owen, Cunningham, Edes, and Solis Cohen. N. Mackenzie reported twenty cases treated with thymns (Amer. Journ. Med. Sci., February, 1897). One died, six showed no improvement, thirteen showed some improvement, which, however, was not considered marked or conclusive.

Hypertrophic astro-arthropathy was described by Bamberger and in 1890 by Marie as children of the best phalanges and thickening of the nails of fingers and toes, enlargement of all the phalanges, and later of the bones of the forearms and legs and joints; not of the face and skull. It is connected with or dependent on suppurative long diseases, empyema, abscess of the lung, bronchiectasis, and sarcom of the lungs. Venous obstruction may now and then be a causal factor, but the influence of toxina formed in cavities is more probable. It is by no means so rare in children as it is reputed to be In a small hospital service I saw two cases in one year. They are apt to improve with the improvement of the local trouble.

Addison's Disease,-The "suprarenal melasma" depends on anonalies (tuberculosis, carcinoma, induration, hemorrhage) of the adrenals. According to Otto Ramsay (Johns Hophins Hasp. Ball. vol. x., 1809, p. 24), of thirty-live cases of carcinoma whose ages were known five were between one and twenty years, of twenty-six cases of sarcoma whose ages were known eight were between six months and ten years old. Such immors were more frequent in the male, and attended by pain and emaciation, and exceptionally only with changes in the skin. Removal was successful in two cases. In some cases the semilurar ganglia have been charged with being its cause. Great muscular weakness, debility of the heart, frequent and small pulse, irritability, later apathy, cephalalgia, cardialgia, decrease of red bloodcells, and exhanstion (together with the characteristic discoloration of the skin) are the symptoms common to a number of constitutional ailment's leading to a slow death. The treatment is, therefore, to a great extent, that of the anomias, and requires iron, arsenic, strychnise. and measures directed against incidental symptoms, such as diarrhota. Adrenals have been given in powder or in glycerin extract, or raw or cooked. Tabloods are prepared by different manufacturers, in which, as a role, one grain corresponds with fifteen grains of the dried extract. They mostly weigh five grains; not more than one daily would be a dose for a child. Locally the fresh watery solution (suspension)

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of the powdered extract has been med extensively on account of its blood-vessel-constricting power in conjunctivitis, rhintis (hay fever), pharyngitis, and as a harmostatic, now and then in combination with cocaine. Parke & Davis's "adrenalin" is a solution of one in one thomsand, and is to be used in drop doses (a to 4) several times a day, ten or more in the adult. According to T. B. Abdrich (Amer. Journ. Phys., vol. vii. p. 359), adrenalin is identical with the copper-sulphate-reducing body, the blood-pressure-raising substance, as found in the gland, and is therefore the active principle of the same, and not a changed or modified form as L. J. Abel contends (Johns Hopkins Hosp. Bull., 1901, vol. vii.). Epinephrin appears to be a changed form of adrenalin. It does not reduce Fehling. The equivalent of two glands was administered by Osler, with varying results; he has a case (adult) that gained fifteen pounds in six weeks and felt stronger ("Princ. and Pract. of Mod.," 2d ed., 1895, p. 749).

Most valuable general information on organotherapy we owe to Hun and (Amer. Journ. of Med. Sc., July, 1807) to Kinnicutt, who gave the results of vast experience and large numbers. According to him, in accordance with other observations, the myxodema of cretinism is readily removed by thyroid treatment. The earlier it is commenced in the young the greater is its influence on growth and mental development. In the idiot, with a lymphatic rather than a myon-lemmous condition, improvement is also obtained. Hyperplastic goitre (not the cystic) is greatly improved if not cured. Exoplithalmic goitre was not improved; on the contrary, many patients felt worse. Obesity is influenced rapidly, losses of from two to eleven pounds having been observed; these losses will continue for some time only. Psoriasis is influenced to a certain extent only: the thrrold treatment seems to have no better effects than others. Other skin diseases were not particularly benefited. Of forty-right cases of Addison's disease treated by suprarenal extract, six were citred. twenty-two improved, eighteen not improved, and two aggravated. Thomas extract appears to be useless in exophthalmic, beneficial in hypoplastic guitre. Of thirty cases, there was improvement in twenty, a cure in two. Pituitary preparations were used in thirteen cases of acromegaly. Varying degrees of improvement were noticed in seven. none in five, and one became worse. In one the affected extremities decreased, in two the pain in the head and limbs diminished."

Diseases of the splees are rarely of a primary character; but

^{*}Thymna has been administered in adversal disease, became the thymns gland was often found enlarged in &

most cases of psychophone are congenital, and not amenable to any medicinal treatment, except sarcoma, which cannot be cured, but may be favorably influenced by arvenic and by the toxin of the crysipelas coccus and the bacillus prodigiosus (Coley). It is not so rare as it is reputed to be. I am certain that I see a case annually. The majority of changes occurring in the spleen are connected with, or dependent on, constitutional ailments, and result mostly in enlargement of the organ. Malaria, leucocythaunia and pseudo-feucocythaunia (Hodghin's disease), and amyloid degeneration have their own indications. Rhochitis and syphilis are liable to produce induration depending on hyperplasia of the connective tissue. Tuberculosis of the spleen is a frequent complication; sometimes, in the very young, the spleen is the first place of deposit of acute tubercular infection. The deposits are sometimes of microscopical size only. The differentiation between tubercular deposits (transparent in very acute cases only, otherwise slightly yellowish, sometimes caseous, of unoqual size and irregular distribution) and the follicles of the spleen is not always care. Heart disease may lead to embolium, inforctions, ruptures, and obscesses (the latter forming also a part of general pramia), typhoid fever to softening and calargement. This condition expands the peritoneal covering and causes perioplemitie, though it be not always distinctly amenable to diagnous. For, indeed, the younger the infant the less is percussion-being hampered by the frequency of sympanites-able to reveal the exact size of the spleen. Unless it can be felt below the margin of the ribs, it should not be assumed to be enlarged. There are even cases in which it can be so felt, and still there is no enlargement, for in some instances the spleen is found threended or floating ("ptosis").

Banti has described a condition in which the spleen is enlarged for years, the enlargement is then followed by asones, and finally by cirrhosis of the liver, the reversed order of the symptoms observed in the latter condition. Hamoglobin was found to be reduced more than would be explained by the reduction of the red blood-cells.

As prisonry apleasuregaly, or apleate marmia, a condition has been described which furnishes a large spleen, assemin without lencocytosis; sometimes bemorrhages, ascites, and enlarged lymph-bodies. For this condition, as also for malarial hypertrophy, for floating kidney, and for rupture, the spleen has been extirpated, with stcreasing successes. In lencocythamia it has not been successful, maybe became the operation was performed too late. Possibly other organs assume the function of the spleen after its removal; for Hodotopyl found a general (compensatory) lymph-body hyperplasia in a case of absence of the spicen. The same has been observed in some cases of aplenocromy.

The therapeutics of the constitutional disorders above alluded to has been discussed in previous papers. Quinine, ergot, and arsenic have been shown to be efficient in some and absolutely mert in others. The combination of quinine and ergot, with or without iodides, is probably among the most powerful remedies in chronic cases. Acme instances of swelling and inflammation require ice energetically applied, purgatives, and large doses of ergot; the presence of pasternands incision and dramage. To ascertain that condition exploring punctures, carefully executed, can be made with safety. To what extent extirpation of the organ can be rendered serviceable in chronic cases remains for the future to demonstrate. Many of them that are dependent upon disorders of circulation or nutrition are more amenable to a preventive than to a curative treatment.

6. Hemorrhogie Diethesis.

Under this heading I propose to treat of purpura, the hemorrhagic disease of Werlind, scurpy, poliosis rhematica, and hemophilia, because of their similarity of symptoms and their-to a certain extent -miform anatomical cause. Among them all, the first, with its tride-sperad petechiae and subentaneous and cutaneous hemorrhages, is most frequently mentioned. It results from all causes interfering with general nutrition, and particularly with that of the blood-vessels Among them are poverty, uninhabitable dwellings, chronic gastrointestinal catarris, overdoses of torpentine, dysentery, typhoid fever, diabetes, miliary telerenlosis, pneumonia, diphtheria, scarlatina, measles, grave assemin, lencocythamia, hepatic and renal diseases, and severe intestinal autointoxication. Relapses are very common The complications with hemorrhages from the mucous membranes of the nose, stomach, and intestines, from the kidneys, into the brain and retina, and often with fever, are denominated Werlhof's disease. The diagnosis of "senrey" requires bleeding from the gums, "peliosis" complications with "rheumatic" pain and swelling of the joints, but without an affection of the heart, and hemophilia the hereditary tendency to general or only local (kidneys, gums) bleeding of (mainly) the male transmitted through the female, on the bases (Virchou) of narrourness of the arteries and insufficient development of the thin Mood-vessel walls.

The alleged defective condition of the blood does not explain the homorrhagic tendency. No blood, though ever so thin, penetrates a healthy blood-vessel wall. Hydramia by itself does not produce bleeding without an impaired condition of the tissue of the bloodvessel; thus it is that the same degree of america in women may result in metrorrhagia in one, in amenorrhous in another. Infants are pseuliarly hable to bleed, because in them the blood-vessel tissue is still undeveloped; the embryonic condition extends into early infant life, and frequently gives rise to bemorrhages into the brain, steninges, and other serons membranes. When morbid influences are added to this physiological predisposition, the result is easily comprehended.

These influences are unknown. Bacteriological explanations are not yet quite satisfactory, in spite of Babes and many others. Plakel stein (Chariti Ann., vol. xxi.) connects the hemotrhagic diathesis with the bacillus pyocyaneus, and found streptococci in the blood-vessel walls. It is possible that all these varieties of hemotrhagic diathesis, which have been subsumed by Wilhelm Koch under the common heading of "scurvy," are more or less acute infectious diseases. That suspicion appears particularly justified in regard to purpura fulminans, a few cases of which have been observed in the very young (Henoch).

The treatment is to a great extent preventive. The social condition of a large part of the population is a main cause and ought to be improved. Thus the successful treatment depends largely on the prosperity of all, and is another proof of what ought to be considered a fact, that medical and social questions and aims are frequently identical. Zymotic disorders and cruptive fevers should be treated with a view of sustaining the strength of the system and the vigor of circulation. The heart's action ought to be matched constantly, and cardiac tonics given before heart-failure sets in. The dietetic treatment of these diseases is at least as important as their medicinal management. In this way hemorrhagic diathesis is kept off, as well as exhaustion.

Medicines can accomplish a great deal, but ergot less than 0 is often credited with. In these conditions I have often met with its impoward influence on digestion, and but rarely with a favorable influence on the hemorrhagic deposits or processes. Perhaps hydrastis does better, stypticm in one-tenth of a grain (0.005) does frequently, adrenal substance a few grains daily, adrenalin (Parke & Davis) in drop doses, and gelatin subsutaneously in one- or two-percent, sterilized saline solution. Stronger solutions may be meabally on a blending surface or in the rectum. The styptic effect of calcium chloride, from five to ten grains (0.3 to 0.6) daily in all forms of hemorrhage, appears to be well established. It has been

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administered to pregnant women in bleeling families. Iron does not appear to yield desirable results; among its preparations the tincture of the chloride is perhaps the best; the tineture of the malate and the aquor of the alluminate are well tolerated. Digitalis has a favorable effect on the heart's action; an infant of a year may take the equivalent of from one to four grains daily for some days, two grains daily afterwards. With it stryclinine may be combined; the same baby may take a fiftieth of a grain daily. As relapses are quite frequent, the invigoration of the blood-vessels is the main object in view. From one to three drops of Fowler's solution, largely diluted, may be given every day for a long time. Better still is phosphorus, the method of administration and the doses of which have been detailed in a former chapter. Lead and tannin have not satisfied me at all. Local honorrhages, when accessible, will require the application of ice, or compression of the Meeding vessel. The solution of antipyrin (5 to 20 to so per cent.), with or without tannic acid, is a good styptic. The success of the preventive treatment of haemophilia will be rather doubtful so long as individuals are not controlled by the community. nt regard to the demands of public health. The daughters of haenophilic families ought to be prevented from, and protected against. contracting marriages and having children. Phosphorus, administered in small doses and continued a long time, seems to diminish the tendency to bleeding.

Infantile scurve (Barlow's disease) has become very amenable to treatment, both in its early and in its advanced stages. Its main and characteristic symptoms are pain and immobility of the (mostly lower) extremities; swelling (mainly) of the diaphyses, which depends on subperiosteal homorrhages; peterline, and exchymoses over any part of the skin, particularly of the eyelids; spongy condition and purple color of the gums, no matter whether teeth have appeared or not (contrary to Barlow in Keating-Edwards's Cyclopedia, vol. v., 1840); and senetimes separation of an epiphysis. These symptoms are frequently complicated with the timefied epiphysis and other marks of rhachitis. The prognosis is mostly good. The principal remedy is fruit-juice, that of from our to two oranges a day, or of a pincapole; it is the specific. Complications with rhachitis require, besides, the clixir of phosphorus. Sterilized milk, if the only matriment, as in many instances it will be found to have been, should be banished. If no reliable sweet milk be accessible, it should be pusteurized and combined with cereal (barley, extmeal) decoctions, and meat-broths or some meat-juice should be administered as a regular fixed. Within a few days recovery will begin.

7. Disbetes.

Diehetes secilities is by no means a common disease among infants and children, but it is not so rare as some will have it,—even acute diabetes running its full course within one or two weeks, mostly from trauma of the head, has been observed,—nor so frequent as those assert who have found glucose in the urine of infants whose food was supplied with an mussual quantity of sugar. Indeed, traces of sugar are often met with in the urine of nursings. But this is not "diabetes."

In the ten years before 1860 there were thirty-one deaths from actual diabetes in Great Britain in children under fifteen years, ansmally. Since that time the occurrence of the disease in every period of life appears to have become more frequent. Hereditary (Blumenbach) and family influences, such as neuropathies, epilepsy, insanity, syphilis, exert a great influence. Isentlamm reports seven diabetic children in one family; Thomas three brothers; Mosler a diabetic woman whose father, mother, two sisters, and son died of diabetes. Nummyn five children in one family. Caron reports the cases of three children of the same mother, at the ages of three and a half and one and a half years, and of three months. I have seen two boys in one family, of five and three years, and other instances of multiplicity of the disease. Hydrocephalus, injuries to and tumors of the head, colds, atrophy of the pancreas, dysentery, morbus maculosus, measles, and scarlating are referred to as causes. In most of the cases which have come under my own observation I could not elicit one. The highest percentage of sugar I have noticed in a child (boy of four years) was six and one-half. Heubner observed eight and one-half. with a daily quantity of five thousand grammes, or five quarts; Leroux ten and one-half. But it is not so much the percentage in the total amount of glucose eliminated in a day that is of importance. The specific gravity of the urine is not always high; I have seen it as low as 1007 and 1005. The prognosis is not so good as Redon and a few others appear to believe. Twenty-five years ago Kulz reported six recoveries in one hundred and eleven. Wegeli, thirty-nine in our bundred and eight cases. I am afraid the diagnosis was obscured by the facility with which copper is reduced by creatinin, creatin, and other constituents of the urine." Therefore, several (different) tests

^{*} Possibly, bin not probably, as only five pure cases have been reported a morable world be made in regard to "pentouries," which is no illness, it appears, and may occur in full health. In it there is a correct glucose reaction by Febling and by Nylander, but not by fermentation (Salkowski).

should be employed when dry skin, emaciation in spite of ravenous appetite, polyuria with high specific gravity (up to 1044), also farunculosis, are noticed. A new and reliable test was furnished by I. Rudisch (Festschrift). The disease runs a more rapid course in infants and children than in adults, and terminates more readily in come and death. I have seen recovery in but twenty cases. Therefore the treatment must be circumspect and energetic. Strict amidiabetic dirt should be enforced. Fortmately, the young, with very rare exceptions, are apt to live mostly on milk, which may be given copiously in any form. Thus less difficulties are encountered in them than in adults. For these also milk, skimmed or not, forms a principal and beneficial part of their nutriment. Saccharin or glycerin may be used instead of sugar. "Gluten bread" contains too much starch, the "alegrorat" of the Germans about half as much as common bread. The medicinal treatment of the young requires some medifications. The facility with which cerebral symptoms ("coma") are developed renders the persistent use of alkalies advisable (mineral waters), mainly sodium sulphate. Opium is tolerated in increasing doses. Jodoform, which I have seen render fair service in adults, in daily does of from ten to twenty grains internally, is seldom tolerated by the young, even in proportionately small doses. Arsenic may be given in increasing doses a long time, the bromide at well as other preparations; one drop and more of Fowler's solution, largely diluted, after meals, three times daily, the medicine to be increased gradually until from two to six drops are taken. As at every discase which resists treatment to an unusual degree, a large number of other medicines have been recommended. As this book is not a Thrary, but written for practical purposes only, I abstain from emumerating drugs which I believe to be useless. There is one, however, which, in connection with everything destined to improve digestion and assimilation, appears to have a very favorable influence on the diabetic process. Sodium salicylate, with an alkaline beverage (Selters, Vichy), has a decidedly favorable effect. A child of five years. may take from five to eight grains, three times a day, and continue its use for many weeks, to advantage. Lactic seid (Cantani) may he tried with equal parts of sodium bicarbonate in water, one or two grammes a day (fifteen or thirty grains), calcium lactate in the same or larger doses. Extract of jambul has been powerless in my lunds, benzosol in daily doses of a gramme or more acts more favorably. Antipyrin appeared to be a little more efficient, the feeding with nuncreus not at all. The prognosis was always had when exclusive noid on result casts made their appearance. Tuberculosis is not so

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frequent as in the adult. Fournier (Sew. Med., 1900) publishes the case of a diabetic and heredo-syphilitic girl of eight years that got well with antisyphilitic treatment.

Diobetes insipidas is a rare disease, but more common than disbetes mellitus. A large amount of urine of low specific gravity (1000)/2 to 1005) is secreted daily. Increased micharition, great thirst, and emaciation are among the prominent symptoms. In some cases there appeared to be an heroditary influence. Syphilitic and other brain lessons, and injuries, have been found to explain its occurrence. In one case of mine (that of a girl of five years) it ceased, together with a copions and constant salivation, after the removal of a tenia mediocanellata. Inveterate masturintion and consecutive "neurastheria" appeared to be the cause of the excessive flow of urine in several children of from four to eight years. It ocased gradually with the restoration of correct habits and better general health. Of the remolies which have been recommended. I mention valerian, risc valerianate, bromides, sosfium salicylate, and galvanization of the head. All of these proved unsatisfactory in my hands. But I have seen good results, and sometimes speedy improvement, from the administration of ergot and atropine. In other cases they were absolutely useless. A child of five years may take daily, of the former two cubic centimetres (half a drachm) or more (ext. fleid., or the corresponding amount of ext. ergot., or ergotin), of the latter onehundredth of a grain or less (one-half of a milligramme). Morreliable than either has been strychnine, in three daily sloses of onehundredth of a grain each, or more (one-half of a milligramme). Zinc valerianate may be tried in daily doses of from half a gramme to one gramme (seven to fifteen grains). Opiates are highly recommended by Bouchut; pilocarpine, antipyrin, and lead acetate by others. Fortunately, the prognosis is much more favorable than that of diahetes mellitus, particularly in hereditary cases. General roborant treatment, iron, quinine, stryclinine, and cold water to improve peripheral and cardiac circulation and the tone of the nervous system.

v

Infectious Diseases

1. Tuberculosis.

Is ten hundred and forty-five autopsies made in the New York Foundling Hospital (Northrup) and the Babies' Hospital, all of which were reported by Dr. L. Emmett Holt, tuberculosis was found in four-teen per cent.; altogether one hundred and mineteen cases. These and similar statistics demonstrate the frequency of tuberculosis in infancy. From the first to the fifth year it is the same. In the above one hundred and nineteen cases the lungs were affected one hundred and seventien times, the pleura sixty-nine, the bronchial lymph-nodes one hundred and eight, the brain forty, the liver seventy-seven, the spleen eighty-eight, the kidneys forty-six, the stomach five, the intentions forty, the mesentery thirty-eight, the peritoneum ten, the pericardium seven, the endocardium one, the thymns three, the adrenals three, and the pancreas three times.

In the tornig, as in the old, tuberculosis is specad either by mechanical transmission through cough, deglutition, and aspiration, or in the contiguity of tissues after having been developed in a given locality, or through femph-ducts and blood-yessels. The latter, after baving absorbed bacilli from the primarily invaded part, are liable to distribute them in a distant locality or all over the system in the dupe of acute miliary teherculosis. Most frequently the primary seats of the affection in the young are the bones, joints, and lymphhodies ("glands"). The adencids harbor tubercle bacilli a long time; they were found in sixteen per cent, of a large number of cases examined. The blood-vessel walls are frequently the original seats of tuberenlosis (peris and endangeitis); that is why the first visible symptom of tuberculosis may be a homorrhage, and why in tubercular meningitis the unbercles are found along the small blood-vessels. Among the latter, those of the mesentery are by no means so frequently affected as they are still reputed to be; those of the neck

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With the exception of a very few (intermittent fever, rheumation), all the diseases enumerated under this heading are also directly or indirectly contagions. As it is not my intention to appearantee closely, they all appear in this chapter indiscriminately.

and mediastimum are more subject to early infection through the neighboring mucous membranes. When tubercular they have more tendency to conglutination and adhesions than the benign form, which is more apt to remain isolated. When they have remained for some time it is not advisable to waste time with inunctions or injections of arsenic or zine chloride. Their only safe treatment is removal. In case of doubt, the diagnosis may be made by the injection into a muscle of from one to free milligrammes of a one-per-cent, solution of Koch's tuberculin.

Bacilli may be swept into the circulation through healthy epithelia, but the majority of infectious take place in a morbid condition of the integuments, either epidermoid or mucous. Wounds facilitate the admission of bacilli (circumcision, eczema, enr-rings, medicinal subcutaneous injections, or contact—stremuously denied lately by R. Koch—with eartle tuberculosis; vaccination exceptionally only). The nose, and the pharynx when sore or ulcerated, may be equally dangerous; the former the more frequently the younger the children, with their dirty finger-nails about their nostrils when playing on the floor, or at any time. The mediastinal and bronchial glands are mostly affected through direct inspiration into the pervious endothelial layer of the alveoli.

The most common forms in which tuberculosis makes its appearance in the young are acute military tuberculosis, many cases of acute or subscute curcour furminosis, and germine chronic palmourry inherculosis with cavities. Caseation, however, does not always mean tuberculosis; for it is also met with as the final transformation of puse of carcinoma, and of typhoid infiltrations. Tubercular absences of the lungs are not at all frequent, but we see them at every agri-While I have met with last very few cases before the end of the first year, they are not very rare after the sixth or eighth. Pulmonary tuberculosis is often accompanied or preceded by pleurisy; indeed, it appears probable that this pleurisy, with its frequent relapses, is the primary seat of tuberculosis in many.

The most common form of pulmonary tuberculosis in the young is that which is developed after caseous pneumonia. It is a frequent result of bronchitis and catarrhal pneumonia attending measles and whooping-cough, and is quite generally accompanied by considerable changes in the neighboring lymph-bodies. It is often seen in the lower lobes; indeed, what is frequently suspected to be pulmonary tuberculosis of the upper lobes is apt to be induration, resulting from interstitial inflammations of infancy, which retract the corresponding part of the chest, exhibit diminished respiratory minimum, prolonged

expiration, and diffness on percussion, and may last a long lifetime without endangering life or health to any comiderable extent.

What I said about the mode of development of these frequent. forms points at once to preventive treatment as the principal indication. If brouchitis, catarrhal pneumonia, measles, whooging-cough, and glandular diseases are frequent causes of inherenlosis, those primary affections must be effectually treated. There is no broughtis which cannot be made milder, many a case of caturrhal pnermonia may be shortened or rendered less dangerous, and most, perhaps all, cases of whooping-cough modified and shortened. In a former dupter I insisted upon the necessity of watching and treating all the self-limited diseases. The sin of omission is as grave as that of commission. And in my remarks on scrofula, to which I here refer, I pointed out the facility of cradicating the coming evil by removing the malsorbable timefaction of lymph-bodies. Unfortunitely, the success of treatment in cases of acute miliary tuberculosis is so small, and of chronic tuberculosis so unsatisfactory, that the indications for preventive treatment are the more urgent. The fact of universal tuberculosis arising from a local source cannot be deried, having been proven by thousands of experimental and clinical observations. Now and then a case is quite demonstrable. A few years ago I had a little girl in my division in Bellevne Hospital who suffered from the most exquisite and extensive tuberculosis of the skin I have ever seen. She finally thed of empyema and general tuberculosis. Coming from a fairly healthy family, she developed a glandelar swelling in her right mills, which was neglected, and permitted to break spontaneously and result in sinuses. From that place the lymphatics transported the accidental bacillary infection, and produced extensive ulcerations over the chest; metastases took place in other parts of the body. It is of no account to investigate whether the original affection was inhercular or whether the tubercular character was developed afterwards. This much is certain, that the child need not have died if the lymph-body which was primarily affected had been extirpated.

It is unnecessary to add that tuberculosis of the bones and joints, so frequent in infancy and childhood, requires prompt attention and in some cases operative procedures.

Among the causer of tuberculous consumption which makes its appearance in otherwise healthy persons, both young and old, the following also are given prominence by all observers of note: insufficient supply or change of air, absence of exercise, overwork without rest or vacation, monotonous food, and in larger children persistent mental emotions; also travma. Most of these sources of disease art

as well on the young as on the old, and may lead to infiltration before there is any cough, but aniemia, muscular debility, and loss of appetite only. Therefore tubercular infiltrations are frequently found among the innates of prisons, particularly those who have been isolated a long time, workmen in factories, soldiers in harracks, students in seminaries, children in orphan asylums and large boarding-schools, those attending crowded public schools and overworked in their private studies, besides being crippled by unwise discipline, which requires absolute immobility, and by loss of time or opportunity for exercising. It is not very probable that the occasional stately promenades of the young by couples-though not handcuffed, though on a Madison Avenue sidewalle, though attended by the good-will, moral character, and Argus eyes of two elderly ladies-are equivalents for the free and unhammered play and development of the growing organs. If it be a fact that there is so much less tubercular disease among hunters, farmers, gardeners, and sailors than among factory men and women of all trades, school-masters, and tailors, it is certain that rowing, skating, gymnastics, and tennis, even the so-called calisthenies, if peactised in the open air, would expand many a child's chest, aërate his blood, keep his organs vigorous, and eliminate invading poisons,

There are many other causes or influences creating or increasing the possibility of tubercular invasion. A considerable predisposition is created by the vulnerability and fragility and ordenatous infiltration of scrofula; by the catarrh produced by sedentary life and foul inhalations. Koch has proved that active bacilli pass the stomach unmolested and may infect the intestine when this has a superficial lesion, thus rendering even a primary intestinal tuberculosis possible.

While direct heredity is rare, hereditary predisposition to tuberculosis is quite frequent, and is transmitted even by such parents as appear to be in fair health. Constitutional parental disorders resulting from the influence of scrofula, rhadhitis, and even applilis may finally prepare the children for a predisposition to tuberculosis. In such children every catarrh must be carefully watched. The prenature ossification of the costal cartilages, most frequently found about the superior part of the thest, and the consecutive shortening of the stemo-vertebral diameter give rise to contraction of the thorax and insufficient expansibility of the (upper lobes of the) lungs. In such cases the aeration of the blood suffers at a very early date, catarrhal and inflammatory thoracic diseases are liable to become dangerous, and gramustic exercises are required in early childhood.

Direct transmission from the diseased parents to the children to probably more frequent than is commonly believed, and therefore the child should not share the room and bed of the consumptive. Kissing must be emitted under these circumstances; it may often be the cause of contagion, though, perhaps, not so frequently as, for example, dipatheria is transmitted in that manner.

The origin of pulmonary consumption is uniformly, in almost all instances, attributed to the inhelation of bacilli. As they are deposited on bedding, clothing, and on the floors and walls of rooms, in bandkerchiefs and towels, where they dry and are easily movable, nothing appears more natural than that the long-lived microbes should be admixed with the dust of the room, and thus inhaled. In this way the contagion of acute exanthemata is certainly disseminated. Tuberele barilli, like everything solid, when floating in motionless air, are certain to sink gradually, and the inference is that children are more liable to inhale them. This mode of propagation has been taken to be the principal one in pulmonary teherenlosis. To such an extent has this belief controlled the teachings of medical men that the rules and regulations of health departments concerned themselves with this mode of transmission only. Experiments, however, appear to prose. that the air-currents usually found in a room are not sufficient to detach dry hacilli fastened with their surrounding sputum to the walls or floors. It is only strong currents, such as are caused by sweeping, beating, brushing, perhaps even by violent slamming of doors, that will float them. Under these latter circumstances it is certainly possible that dry bacilli may be detached and infect those present.

Fingge (Zeitsch. f. Hyg. a. Inf. Kraukh., vol. xxv., 1893) published a long series of experiments and observations which appear to be able to stand accurate tests. Crying, succeing, coughing, even talking, iletach spatian in more or less invisible quantities. Everybody's experience yields such instances—palpable ones—in the sick and well. Such most particles, mostly infinitely small, were proven to remain in the nir of a room five hours. Indeed, an air-current of from our to four millimetres a second (= twelve to fifty feet an hour) sufficed to float them for that length of time. In this manner the contagiousness of pulmonary tuberculosis is even more pronounced than by assuming the dry somum to be the only means of conveying the disease, and the direct transmission from husband to wife or children, from the woman in childhed to her newly-born, or between patients in a hospital ward or sanitarium becomes almost a matter of course.

It is evident that the newly-born cannot be safe with its consumptive mother, and just as probable that a "sanitarium," a ward, a hospital filled with tuberculous patients, is a bothed of mutual infection.

A consumptive mother must not noise her infant because of the danger of immediate contagion through sputum. Besides, her milk may be, though it rarely is, infected like the milk of tubercular cows, even though their udders may not be diseased. Two cows, at least, out of a hundred are tubercular. Thus the least that can be done to to boil the milk intended for the nourishment of the infant. Koch's and other attempts at proving the disparity of borine and human tubereniosis are not yet successful. Morphologically, chemically, and in their enflures they are alike or similar. The bacilli are active in both races, instually, but their virulence differs even when going from man to man, and also when going from cattle to man after having been quite marked when disseminated among cattle. Thus, if we obey the rules I have enjoined more than forty years, the milk can be made more innocuous than is possible even for butter * or cheese. obtained from such cows. These miles ought to be strictly followed. though there be exceptions to the universal experience. An instance of such exceptions is mentioned by Biedert, than whom there is no more reliable observer. He reports the cases of children who were fed a long time on the milk of tuberentar cows without being attacked themselves. The ment of tubercular cattle is not infected (for baciliare not found in muscles) and therefore not so dangerous as possibly their milk. But, after all, the presence of inherenlar cattle in a community is more than simply objectionable. Its dangers exist, though they may have been exaggerated. That is why Koch's tuberculin. which failed as a cure, has proved a preventive, inasmuch as it rescals the presence of tuberculosis by the elevation of temperature following its subcutaneous injection.

Among the causes of consumption monotony of food has been enumerated by many. It is evident that it is of little account in the cases of infants or children, whose liabits are plainer and digestive functions more inlapted to simpler and more uniform articles of ifet. Most of these, while in health, are satisfied with mile, cereals, and but little meat. Sweet cream may be added to the mile, but more than a few ounces are not digested through the course of a day. Cod-liver oil acts not only through its fat. During the afebrile con-

[&]quot;Better does not seem to be very dangerous, for member Schuchardt nor-Rabinowstock (Koch's Institute) found tobercle bacilli in eighty samples of better takes from different stores and markets. Twenty-three of them caused, in gainest-pigs, alterations resembling, but not exactly like, inherentous (Destude seed. Work. August 5, 1852). Many similar investigations have since proved that the bacilli charge in virulence, which decreases or increasescending to charging circumstances, calmos-moda, etc.

dition and chronic emaciation, over-alimentation, introduced by Debowr, may be tried to advantage, while the insufficiency of gastric digestion may be stimulated by the administration of artificial gastric juice (pepsin with murianc acid) and mild stomachies (gentian, next diluted alcoholic beverages) and orexin tamate in three daily doors of from one to three grains (0.00 to 0.2). When exercise cannot be taken to a sufficient extent, or is contraindicated by the necessity of enforcing temporary, but alsolute, rest, massage, according to S. Weir Mitchell's plan, will take its place. During lever, overalmemation is to be stopped, it deranges digestion and increases bodily heat. Alcoholic stimulants will at that time often take its place to advantage. While they do not act well in certain over-irritable natures with over-sensitive hearts, and in hamoptysis, they are good stimula for the general system, diminish perspiration, and act lavorably in diarribera.

In the treatment of inherculosis no single factor is a cure by stelf. The quality of the air alone will not cure the sick any more flue a certain mixture of salts and water in a mineral spring, or some known chemical relation of albuminoids and carbohydrates in an article of food. Insufficient clothing and bedding, unheated rooms, draughty talls, indigestible food, strong coffee and tea, hot cales and cold drinks, late hours, lively hops, brass instruments and pianos disturbing midnight rost, kill as many, in proportion, in Colorado, Florida, Southern France, and Italy as in New York. Unfortunately, we know too well that our patients believe they have done enough for their physician (or themselves?) when they have followed his advice to change climate. In this respect, too, it is true that those who speed over the sea are changing their sky, but not their spirit." It should never be forgotten that the change of climate is mostly a negative. remedy, and cannot be expected to offer more than the possibility of favorable external circumstances. Some cartion should be observed in regard to places with an old and established reputation. A mountain resort of deserved great repute will change its character when the village changes into a big manufacturing place, with soot and sulphuric acid in place of a clear atmosphere.

Most air is a better conductor of warmth than dry air. Thus loss of temperature is more rapid in most air than in dry air. Dry air, therefore, may be very much cooler, and is still better tolerated in spite of its lower temperature, and affords more protection. Hamoptysis appears to be a frequent occurrence at the times and

[&]quot; Carlers not arienne motast qui trace mare coront."

seasons of increasing atmospheric moisture (spring). According to Robden's researches, a rapid increase of the percentage of water in the blood is frequently sufficient to produce a hemorrhage. Thus the drinking of large quantities of water ought to be avoided, and no residence be selected for a patient subject to hamoptysis where the atmosphere is very moist. Dry altitudes, such as those of New Mexico, have given me good results in pulmonary hemorrhage. At all events, no place should be selected where the percentages of moisture in the air are liable to change rapidly. The miformity of an insular climate is, for that reason only, not so dangerous to those who have bled from their lungs. Still, dry air and a higher scale of the harometer are preferable.

The diversity of opinions in reference to the climato-therapenties of phthisis resulted from the circumstance that the indications were not distinctly understood. Neither cold nor warm, neither dry nor most, air by itself is a remedy. Warm air does not care, but it enables the patient to remain out of doors. The temperature should be uniform, sudden currents of air avoided, and the atmosphere free of microphytes. At an altitude of sosteen hundred feet their number to greatly reduced (Miquel), there are but few at a height of two thousand six hundred feet (Freudenreich), very few at six thousand, and absolutely none at (velve thousand feet, provided the parts are not, or but little, inhabited. Over-population of clivated villages and cities diminishes or destroys their turnumity. In the factories of the Jura Mountains, with a great working population, at an altitude of three thousand five hundred feet, inherendosis is frequent.

Protection against sudden gusts of wind and rapid changes of temperature is an absolute necessity. The elevated valleys or rather recesses of mountains (Colorado) deserve their reputation in pulmonary diseases. Davos is dusty, windy, and exposed to frequent changes of temperature during the summer, and most not be advised for that season. Woods are wanner in winter, cooler in summer; so is the occur. Both, therefore, deserve their reputation in the chronic ailments of the respiratory organs.

Not the thinness of the atmosphere, but its purity, both on plains and on mountains, is the requisite, and a high percentage of orone. The latter is developed under the influence of intense light, the presence of luxuriant vegetable growth, particularly of evergreen trees (Terebinthinacear), and the evaporation of large sheets of water Thus, ozone is found at moderate or high altitudes, in needle-wood forests, and near or on the ocean.

In the general hygienic treatment of tuberculosis the data requires

particular attention. Sudden changes of temperature, which strike the surface suddenly and work their effects on internal organs by reflex,-" colds,"-in spite of the modern supercitiousness of those who deny any pathological change unless by the exclusive work of lucteria, will always hold their places in nosology. The skin must be both protected and hardened. Wool, or wool and cotton, must be worn near the skin, the fest particularly kept warm, no wet or moist feet permitted, undergarments changed according to season and the alternating temperatures of days or weeks and every night and morning. It is of the greatest importance to impress upon the minds of the very poorest that they must not wear during the day what they have tlept in. Still, while protection is to be sought anxiously, vigor and strength are to be obtained by accustoming the surface to cold water. The daily morning wash may be warm in the beginning, and become gradually cooler; alcohol may be added to the water in the beginning (alcohol alone is impleasant by its withdrawing water from the tissues), or salt. The temperature of the water being gradually diminished, the same treatment can be continued during the winter, with a pleasant sensation of vigor. The subsequent friction with coarse bothing towels sends a glow over the surface and through the whole body; it is desirable that, as much as possible, the patient perform it himself. The easiest way to start the habit is by washing, a short sponge- or shower-loth will take its place soon, and a cold plumpe will be home, even by the weak, afterwards.

It has become fashionable with many to feign a contempt for internal medicines in the treatment of tuberculosis, pulmonary and other. I am glad that I cannot share their opinion. Thus, for instance, I look upon arsenic as a powerful remedy in phthisis. It was eulogized as early as 1867 by Isnard, on a monograph, for its effect both in malaria and consumption, in both of which he explained its usefulness through its operation upon the nervous system. He asserted that suppuration, debility, emaciation, vomiting, diarrhera, and constipation would improve or disappear under its administration. The doses of arsenous acid used by him in the cases of adults amounted to from one to five centigrammes (one-sixth to five-sexths of a grain) daily.

despute is certainly a powerful remedy. It is known to act as a poison and a strong caustic. It prevents patrefaction, though as an antiseptic it ranks even below salicylic acid. It acts favorably in malaria, chronic skin diseases, and maladies of the nervous system, and has considerable, and sometimes inexpected, effects in the treatment of lymphosarcoma and surcoma. It is also said to increase sexual desire and power, and in animals physical contage. Thus there is a variety of effects the intrinse nature of which may be found, uniformly, in the action of the drug on the function and structure of the cells, which, though varying in different organs, have the same nutritive processes. Arsenic has a stimulating effect on cell-growth. In small and frequent doses it stimulates the development of connective tissue in the stomach, in the bone and pendetum, everywhere; in large doses, by over-irritation, it leads to granular degeneration. Like phosphorus, arsenic builds in small doses, destroys in large ones. By fortifying the cellular and all tissues, both fibres and cells, it enables them to resist the attack of invasions, both themical and parasitie, or to encyst or eliminate such enemies as have already penetrated them. Thus it finds its principal indication in the peculiar fragility of the blood-reased walls resulting in pulmonary hemorrhage.

The doses should be small. A child a few years old may take two drops of Powier's solution daily, or a fiftieth or fortieth of a grain of arsenous acid for weeks or months in vaccesson. This amount may be divided in three doses and administered after meals; the solution should be largely diluted. There is no objection to combining it, according to necessity, with stimulants, roborants, or narcotics, and to giving it for an indefinite period, unless the well-known symptoms of an overdose—gastric and intestinal irritation and local orderns—make their appearance. But they seldom will, particularly when small doses of opiates are judiciously added to them. In almost every case, perhaps in every one, it is distrable to administer it in conjunction with digitalis.

In the vertebrate animal, digitalic increases the energy of the heart innicle and its contraction: thereby it increases arterial pressure and diminishes the frequency of the pulse. By increasing arterial pressure it favors the secretion of the kidneys, improves the pulmonary circulation, empties the veins, thereby accelerates the flow of lymph and of the tissue fluids, and exerts a powerful influence on the metamorphosis of organic material,—that is, general mitrition. Besides, what it does for the general circulation and mitrition it also accomplishes for the heart muscle itself. The blood-vessels and lymph circulation of the latter are benefited equally with the rest. Thus digitalis, while called a cardiac stimulant, contributes largely to the permanent nutrition and development of the heart. This effect is not only of vital importance to the removing of the system on general principles, but an urgent necessity in view of the fact that there appears to be a relative undersize of the heart, either congenital

or acquired, in cases of pulmonary tuberculosis; and there is certainly such a predominance of the size of the pulmonary artery in the young, particularly over the aorta, that the normal succulence of the lung becomes pathological quite readily when the insufficiency of the heart muscle tends to lower arterial pressure within the distributions of the pulmotary artery. The selection of the preparation to be administered is not always an indifferent matter. The infusion and the tincture are not always well tolerated by the stomach; digitalin, not being a soluble alkaloid but a glucoside, is not reliable in its effects and not of equal consistency and strength; a good fluid extract, or the extract, is borne well and may be taken a long time. A childfive years old may take about two minims of the former daily, more or less, for weeks and months, or its equivalent in the shape of the extract (two-thirds of a grain daily); the latter can easily be given in pills, to be taken in bread or jelly, and combined with any mediemes indicated for special purposes, such as narcotics, or mix, or arsenic, or iron; the latter to be excluded in all leverish cases or in all cases while there is fever. So long as there is no urgent necessity for a speedy effect, digitalis will suffice by itself; as a rule, it does not operate immediately in these small doses. The addition of strophanthm, or sparteine, or caffeine, all of which are speedily absorbed and eliminated, and exhibit their effects rapidly and without the danger or inconvenience of accumulation, will prove advantageous in many CARCIN.

Greater has been introduced into practice, both for inhalation and internal administration, since 1877. No direct influence on hacilli should be looked for. What it can do is to better the condition of the patient. It will often improve appetite, combat patrefaction, thereby facilitate assemilation, and (sometimes) relieve diarrhox. The doors vary. Almost incredible doses have been given (from ten to fifteen cubic centimetres = two to four drachms daily, and more to adults). Probably from two to ten drops daily is a dose for children, which, according to their ages, may be administered for a long time. Creosote carbonate, almost tasteless and easily borne, is a proper substitute, one or two drachms (4.0 or 8.0) or more daily. Neither ought to be persisted in when the appetite does not improve within a reasonable time, nor during a pulmonary bemorrhage, nor when the urine, which requires frequent examination, contains albumin.

This dozen years I have replaced creosote by guaineal, recommended by Schüller, Sahli, and others, which constitutes nearly sixty per cent, of the very best creosote in the market. A child will readily take from six to fifteen drops daily (according to age) in from three

to four doses. It is best taken after meals, in sugar-water, in milk, or in cod-liver oil. There are but few who object to it. Those who do may take one of its salts, the benzoate (benzosol), salicylate, cinnamylate, or carbomie. Of these I have mostly employed the last, also the first. They are (almost) tasteless and readily taken, in doses of as many (or more) grains as the fluid guaiarol in drops. In guaiacol I have been less disappointed than in any other internal remedy administered in pulmonary tuberenlosis, end-liver tall not excepted. It is a good strenachic, appetite and digestion improve under its use, the cough gradually becomes looser, less purulent, the râles more mucons, and the body weight is ant to increase. While crossole is not well interacted in the stage of cavities and beetic fever, guaincol is not only borne, but appears to exert its beneficial influence even in that condition. There are but few patients who do not derive some benefit. from its internal use. Externally it has been recommended to subducbeetic levers; for that purpose the chest and abdomen are painted with the pure guaiacol several times daily. It has the advantage over creosote of not being contraindicated either in bemorrhage or in renal complications.*

I do not fear that it will be replaced by schittyof (sulpho-ichthyolate of ammonium), which has been eulogized by Colm. Scarps. Le Tanneur, H. Fraenkel, and others. Adults (children in proportion) are expected to take 0.25 in four grains in a capsule before every meal, or from twenty to forty drops four times a day of a solution in equal pures of distilled water. In spite of the admixture of aromatic oil, it has a tool taste and will be administered with difficulty.

After the failure of Koch's toleverslip several aminorins and serous made their appearance. The tuberculocidin of Klebs and the serum of Maraglinno (which is said to contain no antitoxin) have not conquered the universal good opinion of the profession any more than the cantharidin recommended by Liebreich, or the cinnantic arid recommended by Landerer, who asserts that it stimulates and causes leucosytosis, and that leucosytes penetrate the tubercular deposits, which are then alsoeled or cicatrize. Koch's new tuberculin is introduced as containing the insoluble parts of the bacilli in finest mechanical disintegration, while the old was said to be a glycerin extract of the bacilli. What it will do remains to be seen. A patient (adult) in Bellevue to whom I gave increasing doses, beginning with the minute doses recommended (one-fifth of a milligramme of the fluid)

^{*} See my paper in International Medical Magazine, November, 1842, and Framections of the Classrological Association, 1842.

and rising to three minims, showed no reaction whatsoever, though the autopsy proved the presence of extensive tuberculosis. Nor are the exaggerated promises held out for the old tuberculin repeated in the new. This is said by Koch to exert its influence in the very beginning of the morbid process in the lungs, when there is no complication at all with streptococci or septicaems, and when the temperature of the body does not exceed 38° C. (300.4° F.). It is readily seen that under such circumstances there will be but few cases of pulmonary tuberculosis in children in whom, became of the extreme difficulty of the diagnosis at that age and in that stage, the remedy can be administered with any show of justification. The tuberculin premised " by Behring has not materialized.

Other remodies have been used in great numbers. Specifics have been recommended, and symptomatic treatment was resorted to. The success of the latter depends on the judgment of the individual practhioner. No text-book or essay can teach more than general principles and their adaptability to the average case, and the measures to be taken in a number of exceptional occurrences. The indications for the use of narcotics, stimulants, expectorants, and febrifuges will change according to the cases and their various phases. In every case the necessity may arise for antipyrin, phenacetin, sodium salicylate, or quinine, never for acetaniiid (antifebrin), which is a strong anilin poison and apt to change, even in small doses, lacmoglobia into methamoglobia. It may be necessary to decide the question whether the administration is to be made through the mouth, rection, or subcutaneous tissue, or how their effects are to be corrected or combined. I have often found that a bectic fever was not influenced by quinine, or antipyrin, or sofium salicylate; but the combination of the first with one of the latter frequently had a happy effect.

The change in our pathological views, or rather the addition of a new factor to our etological knowledge, has directed our attention to the antisepsis of the respiratory organs. To destroy bacteria is not necessary in order to make them relatively harmless. It is impossible to kill the bacillus without killing the normal cell, but very mild antiseptics suffice to stop the efficiency and proliferation of the parasite. Thus we can hope that the future will teach us how to reach the destructive process in the lungs. For the present, however, neither the inhalation of hot air nor of hydrochloric acid, nor the rectal injections of bydrogen sulphide have done any good. Turpentine

^{*}Thineseth Congress for Internal Medicine, Berlin, masion of June 10, 1857.

inhalitions are frequently beneficial by loosening, in some cases diminishing, expectoration from suppurating surfaces, as they have the effect, mixed or not with eucalyptol or other disinfectants, of destroying the fetor of pulmonary gangrene. The inhalitions of compressed air, or the breathing of normal air while the body is surrounded by rarefield air, will prove advantageous in chronic processes where the object is to expand the contracted lung tissue. Inhalations of ozone may tender better services in future than A. Caillé acknowledged in 1892 (Arch. of Ped., August, 1892). Later personal communications of his express themselves very hopefully (p. 74).

Operative procedures are less indicated in pulmonary tuberculosis of children than even in that of advanced age. The opening of a superficial large and copiously secreting abscess is a rare indication, for the latter seldem occurs except in the semi-adolescent; and if it does, the prognosis is anyway absolutely fatal. Besides, the dissemination of the tubercular process is so general in the lungs of the young that not more than a slight temporary improvement can be expected of an operation.

Among the localizations of inferculosis in children that in the larguer is not frequent. A complication with emphysems of the neck and face has been reported. According to Heinze, larvngeal tuberculosis is not produced by contact, but through the medium of the blood. But the expectorated masses are undoubtedly a frequent cause of the local infection, which is preceded by hyperaemia with injured or detached epithelium. Besides nodulated inflammatory swellings in the mucous membrane, submucous tissue and glands, sometimes even between the muscles, there are small granulatious and alcerations on the cords, with universal catarrh, ordena, and phleymonous destruction. The symptoms are those of catarric and ulceration, and depend on the locality and severity of the lesion. In some cases the diagnosis of pulmonary tuberculosis could not be made in the beginning, and that of the local affection was based on the duration of the ailment, the persistence of the fever, and the steady emaciation. At first the larengoscopic examination revealed cutarth only, and afterwards ofceration and infiltration. The local treatment is that of the catarrh,-inhalation of warm vapors, steam, turpentist, carbolic acid, ammonium chloride; poultices around the neck; opintes at beltime. The spray with lactic acid and the application of isdoform have served me loss well than a daily spray of a solution of one part of silver nitrate in from two to five hundred parts of distilled water. Stronger solutions are rather harmful. The pain produced by interations located on the epiglottis and arytesinid cartilizes is

somewhat relieved by the application (brush or spray) of potassium bromide, morphine, or cocaine, or of an appropriate mixture of two or three of them. Gleitsmann reports cures obtained by lactic acid.

The air around patients suffering from laryngeal phthass may be moist; but it is a mistake to believe that it must be warm. Cold air is warmed before it enters the larynx and lungs, provided it enters the respiratory tract through the nares. Only when it is admitted through the month it remains somewhat cool when reaching the larynx. Thus the nares must be kept as normal as possible, and competent, no matter with what difficulties; nor will open windows interfere with the comfort of the patient, provided draught is avoided. That can easily be accomplished by screens or otherwise.

Ulcerations of the roughe and pharyur are painful, sometimes to such an extent as to require frequent attention. A well-directed spray, as mentioned above, of one part of silver nitrate in two hundred of distilled water (glass to be of neutral, blue, or black color), administered once a day, will be found serviceable in average cases. When ulcerations are localized a drop of the same solution may be applied with a glass rod. Some are so but as seriously to interfere with deglutition. I have been obliged to use a cocaine spray before every meal, or a drop of Magendie's solution (very effective!) on the tongue. For the purposes both of cure and of prevention the mose and masopharyux should be irrigated copiously and frequently with a warm salt solution (6 to 1000).

Tubercular ulcerations of the intentions may descend to the rectum; in that case the local symptoms, and mainly the tenesmus, may be alleviated by warm injections containing gum acacia or hismath, with or without opiates. Food and druk must be warm; bismuth may be given in doses of from two to ten grains every hour or two, so as to form a protection to the sore intestine. Tannin I have not seen do much good. Naphtalin sweeps the whole length of the tract and acts favorably as a disinfectant. I have seen almost immediate improvement after its use. From four to ten grains may be given daily (two to six decigrammes). Now and then the stomach rebels against it; in that case, resordin, in doses of from one-fourth to one grain (fifteen to sixty milligrammes), in powder or in solution, may be given for the purpose of disinfection from three to eight times daily. Though it be very soluble, it certainly is effective to a certain extent. All of them may be combined with bismuth, or lead, or opium. Hydrargyrum bichloride cannot be relied upon for any effect in the lowest parts of the intestinal tract because of its great solubility, the necessity of great dilution, and its ready absorbability. Salol in several daily doses of from one to five decigrammes, (one and a half to eight grains) is palatable and effective.

Fistela is ano is not such a rare occurrence in children as I was led to believe many years ago. No matter whether it is an accidental complication, or the bacilli are conveyed to the parts through the circulation, or the fistula is the result of the presence in the faces, of bacilli and of their action on defective epithelium, or the hands of the child or of the surse convey the infection from the mouth, or the linen, or the floor to the anna, practice has changed entirely during the last decade. The axions that in a consumptive patient fistula must not be interfered with has given way to a more rational theory and sounder practice. The some: they are operated upon and treated the better.

Pulmonory hemorrhages are not of such frequent occurrence. as in adults, but I have observed them in children of from three to eight years. The prognosis is always serious, and rather had when bemorrhage is followed by rise of temperature, which means either secondary broncho-pneumonia or disseminated tuberculosis. A single attack of homoptysis in a girl of eleven years proved fatal be suffocation. The patient should rest upon the diseased side, to prevent, as much as possible, the aspiration of blood, with or without bacilli, into the healthy part. The application of a lump of ice or an ice-bag over the locality of the hemorrhage acts favorably, either through the direct influence of the cold temperature or the reflex contraction of the bleeding vessels. Subcutaneous injections of the fluid extract of ergot, or ergotin in glycerin and water, are very apt to give rise to induration or abscesses; thus it will be left to the pracfitioner to decide in an individual case whether that risk may be taken. Its constituents, comutin and selerotinic acid, should not be recommended on account of their rapid decomposition and irritating effect. Morphine may be given internally also for the purpose of relieving the patient's symptoms, both objective and subjective. If it cannot be swallowed well, the proper quantity of Magendie's solution, not diluted with water, is readily absorbed through the mucous membrane of the mouth or throat. The internal administration of ergot may be supported by that of mineral acids and digitalis. Of the latter, a single close of from two to five grains (one to three decigrammes), or its equivalent, arts well. Dilute sulphuric acid is both efficient and palatable; ten or lifteen drops in a tumbler of (sweetened) water will readily be taken to advantage. Fluid extract of hydrastis, from ten to twenty drops frequently repeated, in an emergency, or hydrastin hydrochlorate in doses of our-one-hundred and-twentieth grain (o.coot), or stypticin in repeated doses of one-

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thirtieth grain or more (0.002) is an effective remely. Lead acetate, in doses of from one-sixth to one-half of a grain, every hour or two, according to age and the severity of the case, is preferable to tannin; it can be given with morphine or digitalis, or both. The patient requires absolute rest and encouragement, and must be induced to make long, forcible inhalations, and told to suppress the cough as much as possible. To relieve it opiates may be required. For the purpose of scopping hemorrhages the inhalation of the sescuichloride of iron (1 to 100) his been recommended. As it was not expected to enter the broughial tubes, its effect was presumed to be by reflex action. I have tried it a number of times, like namy others, but cannot recommend it. Ligature of the extremities tight enough to constrict the veins, but not the arteries, is sometimes quite effective, but should not be continued longer than half an hour at a time. Among the best bemostyptics are calcium chloride, several grains every few hours in emergencies, eight or twelve grains shily for a long time as a preventive; the dry extract of suprarenal capsule, from three to five grains every few hours in an argent case; a sterlized solution (two per cent.) of gelatin in salt water (6 to 1000), of which several ounces (from fifty to one hundred entire continetres) may be injected under the skin. But extensive lesions of a large blood-vessel cannot be expected to be greatly influenced by any of these remedies. Absolate rest (opiates) will contribute to the spontaneous coagulation of extravasating blood and the relief of the hemorrhage.

Night-myats, the result of toxins, are not uncommon in the inherentar plathisis of children from five to twelve years of age. They are favorably influenced by the same remedies which are apt to relieve the adult; such are sponging with vinegar and water, or alum in vinegar and water. A pseuder of salicylic acid three parts. zinc oxide ten, and unwlum ninety, or salicylic acid three, anylum ten to twenty, and talenin eighty to ninety, dusted over the perspiring turface from a powder-blower, in quite beneficial and soothing. For internal administration dilute sulphuric acid, ten or fifteen drops in a tumblerful of water, taken gradually, is found enjoyable by a great many. A single dose of atropine sulphate, from one-half or onegearter of a singramme (one-one-hundred-and-twentieth or onetwo-hundred-and-fiftieth grain) at bedtime, or agaric acid (from four to ben milligrammes), or dishoising (from one-half to one milligramme), or camphoric acid in doses of from fire to ten centigrammes will bring relief. When there is an indication for openm, it may be combined with any of them. When the digestion is good, a fair dose of quinine (from three to six grains), with or without extr. ergot.

(the same dose), or extr. ergot. fluid. (from one scruple to half a drachm), deserves a trial when for some reason or other the above remedies are discarded.

2 Syphilis.

The mitrition of an infant suffering from heredutary syphilis is attended by great difficulties. Many of the mothers who contracted syphilis either before conception or during gestation are ansenie in addition to their constitutional ailment; thus their milk is certain to be incompetent. The former class is very numerous, although women synhilatic before conception are apt to miscarry and have no living children. The latter class (those who contracted syphilis during their prognancy) is not quite so large, fortunately; but still the question will come up now and then whether the baby of a seeman who acquired syphilis in the course of her pregnancy should be nursed by her or not. The theoretical answer to this question has been this: that the baby may be permitted to murse if it have been injected already, but must not be put to the breast if still healthy. That answer is no answer; for in most cases of syphilis thus acquired, and even in the majority of herolitary syphilis (derived mostly from the father, syphilitic before conception), the first symptoms of the disease in the infant are visible after some, or many, weeks only. Thus, solody knows whether the newly-born is infected or not. If such a halty be pure, forble, and in poor general health, nobody would have the courage to deprive it of its mother's milk. Artificial feeding, as frequently carried on, would be a death-warrant. That is why such a baby ought to be mirsed by its mother, and, if exceptions be permissible in favor of the puny, and the puny he expected to thrive on its mother's milk, the vigorous laby's chance will be the better. Therefore I certainly advocate the baby's nursing at the breast of the meeher who acquired syphilis during pregnancy, no matter whether or not the symptoms of the disease be visible in the baby. Meanwhile, both mother and baby must be subjected to a thorough and prolonged antisyphilitic treatment.

The same baby must not be put to the breast of a healthy welnurse, no matter whether or not symptoms have made their appearance in the baby, or whether or not the baby has been subjected to an antisyphilitic treatment. For the nurse must not be exposed under any circumstances, without at least having been made felly aware of the risk she is running.

The mether of a baby infected with hereditary synhilis (by the father) is herself either applifitie or not. If the latter, she is immunas regards her infant,—that is, she will not be infected by her musing exphilitic infant. In both cases she must and may nurse. For if exphilitic herself, she will not render the case of her infant more serious; if not, she cannot transmit a disease she has not herself.* In neither case can she be infected by the diseased infant. For safety's sales, however, both mother and child must be treated.

As said before, no haby, either heroditarily syphilitic or suspected of heroditary syphilis, must be put to the breast of a healthy wet-nurse. Syphilis contracted through the infection of the nipple is liable to be as abstructive as that which attacks physicians through their fingers. Such a wet-nurse must be forbidden to nurse altogether, or permitted only with a full knowledge of the circumstances, and directed, if she accept a place after all, to nurse through an artificial nipple. Meanwhile, the syphilitic or suspected haby must undergo an antisyphilitic treatment. If he be only suspected, but for good reasons, the treatment should not be postponed until positive symptoms may have made their appearance. For mercurial treatment is a less grave interference in the young than in the old, and nothing can be more reprehensible than the opportunity given to constitutional applills to obtain full surge.

From what has been said of the many contraindinations to the infant being brought up at the breast, it follows that artificial feeding turnst often be resorted to. This circumstance impairs the prognosis considerably, and claims the best knowledge and soundest judgment of the well-informed practitioner. Improved methods of artificial feeding, however, improve the prognosis.

The prevention of hereditary syphilis is based in part on that of syphilis in general. Public hygiene is not benefited, as they try to do in New York, under the guidance of a combination of ignorance and hypocrisy, by disseminating venereal diseases throughout the whole city; but by wise superintendence and control of the "social cyil." A syphilitic person must not marry. When a man has contracted syphilis he ought to be treated methodically two years, and three years ought to elapse after the last symptoms of syphilis were noticed before he marries. During pregnancy, when there is a suspicion, both man and woman ought to be treated.

Preventive treatment is required both on the paternal and mater-

[&]quot;"Caller's law." There is also "Profita's law," according to which children born in good health of typhilitic parents are immune against typhilis. There are cases, however, in which children of typhilitic parents acquired typhilis afterwards, and others of persons who, while carrying the traces of honolitary, acquired a new typhilis.

nal side. Syphilizic endometritis leads mostly to miscarriage; when the embryo and feetus survive, the newly-born exhibits syphias at once. Women infected during pregrancy may, or may not, infect their offspring, according to the time of their own primary and secondary symptoms. It is impossible to be stire. In all of these cases, and mainly also in those of women, not themselves syphilitic, who have been impregnated by syphilitic men, a thorough and protracted antisyphilitic treatment is required. Both mercury and iodidesreach the forms through the maternal circulation. For practical reasons, for women with habitual abortion, in whom the diagnosis cannot positively be made. I advise and practise mercurial treatment. It has given me better successes, even in those cases in which thirty or forty years ago, according to Simpson, I gave alkaline (potassic chlorate) treatment. Most cases of hereditary syphilis, however, are derived from the father. It is he who must undergo a strict and effective treatment for the purpose of extinguishing the calemitous

The medicinal treatment of hereditary applilis requires the several preparations of mercury, in many cases indides also. Mercurial preparations are well borne by infants and children. Stomatitis and gingivitis are very exceptional occurrences. The indications, modes of administration, and doses of the remedies depend, to a great extent, on the locality or organ affected, whether skin, mucous membrane, subcutaneous tissue, lymphatic glands, mincles, bones, the viscera of the thoracic or abdominal cavities, the nervous system, or the sensory organs; and on the time at which the first symptoms become perceptible. In the majority of cases this takes place between the fifth and eighth weeks of his. Then the nose, lips, and arms exhibit rhagades; these fisoures are not to be quite painful; the skin is covered with rescola, the palm of the hand and sole of the foot with officerscences; the complexion becomes sallow without being miformly so at all times, for changes and a certain degree of intennission are observed. After a while manufeas, squamous, and papalous emptions make their appearance, postules and vesicles spring up and terminate in ofcerations, gummata appear in the skin. This form permits of a fair prognosis, particularly in the cases of infants reared at the breast. The treatment can be carried out slowly and systematically. It consists in the internal administration of calomel; doses of from one-twentieth to one-sixth of a grain can safely be given three times a day for months in succession. If in any case diarrhora set in, and no fault be found in the food administered or in the condition of the digestive organs, which may have been impaired by other

causes, from a twentieth to a twelfth of a grain (three to five milligrammes) of Dover's powder may be added to each dose.

Other preparations which have been recommended are the bichloride and the cyamide in doses of from one-thousandth to threehandredth of a grain several times daily. The green iodide of hudrargyrum is not so well tolerated as calomel, and the oxidulated tannate of mercury, recommended by Lustgarten, does not seem to offer any advantages. As these pages, however, are being written for practical guidance, and not for the elaboration of the history of therapenties of infant syphilis, I can but advise the use of calomel aseffective and sufficient. The use of the blue ointment has been enlogized under the impression that the internal administration of the drug might lead to digestive disorders. As immetions made in the usual way were found to irritate the skin (oleates are objectionable for that reason alone), it was recommended to apply it to a sheet of soft feather surrounding the knee, and to secure its slow absorption by the spontaneous movements of the haby's extremities. Thus the treatment is left to a great extent to the patient, and the actual dose cannot, to say the least, be determined upon or even estimated. Widerhofer modifies immerious by applying a mercurial plaster of the size of the band, which he changes once a week, to the introcapular region, and praises his results. When the skin is badly affected, from one to two grammes (fifteen to thirty grains) of mercuric hichloride may be added to the daily bath of the infant. This external treatment may be continued for weeks.

A similar treatment is required in those cases in which an infant or child (in the latter in larger doses) has acquired syphilis in one of the many ways in which the disease can be contracted. The ritualistic sucking out of the circumcised prepare has given rise to syphilis as it has produced tuberculosis; syphilitic nipples of a mother or murse, vaccination, kissing, the brashing of the threat with infected instruments, in older children sexual contact, are much too frequently causes of syphilis. This acquired syphilis of infancy and childhood is apt to run a swifter and more deleterious course than the same disease in most adults. Therefore it may become necessary to add to the above treatment such methods as have proved most effective and speedy in urgent cases of hereditary syphilis also.

These urgent cases run a different course from those briefly sketched above. In many of them the diagnosis of hereditary syphilis can be made immediately after birth. General pemphigus of the surface of the newly-born is not a symptom of syphilis, but localized pemphigus of the palms of the bands and the soles of the feet is. It

is seldom the only symptom, though it often requires close observation not to overlook the affections of the internal viscera and the Iones. The latter are often the seat of syphilitic disintegration; in the costo-cartilaginous junctures Wegner studied the changes caused by avphilis, which resemble very much those of early rhachitis. Liver, spleen, panereas, and lungs exhibit two different changes, either gummata or interstitial proliferations of the connective tissue. In the liver these are mainly met with along the blood-vestels and bile-dueta, and are capable of producing jaundice and even total and permanent obstruction of the ducts in the forms or the newly-born. An early timefaction of the splem was the first prominent symptom in one of my cases. Twice I have seen both testicles the seat of sephilizic tumore in the newly-born. The blood-vessels suffer at an early period. Syphilitic arteritis, first described by Heuluce, gives rise to congestions and hemorrhages (petechia and purpura) on the skin and serous membranes, in the intestines and kidneys, in the cranium, and in the thyrms gland; and many early brain symptoms and smilden deaths of the newly-born are due to intracranial hemorrhages, ordens, and softening from the same causes. Nor have the rensory orgam of the newly-born any immunity. C. S. Bull Ins met with iritis and choeciditis.

These are the cases in which the systematic calomel treatment is insufficient. In them it is of the utmost importance to get the systers immediately under the influence of mercury. With or withour the interval treatment, subcutaneous injections of mercury must be made at once. The subcutaneous injections of calomet, which J. Bo: many others, have tried in the adult, have given me, contrary to many assertions of their sponsors, so much trouble in the shape of abacesesor indurations that I cannot bring myself to recommend them in the newly-born, with its spare connective tissue. But a solution of from one to two grains of hydrargyrum bichloride in an ounce of distilled water (1 to 240) is quite innocuous. It can safely be injected once or twice daily, in doses of from one-hundredth to one-fiftieth of a grain (one to two nilligrammes). That treatment I have followed in many an urgent case more than thirty years, and can safely recommend it. No reliance should be placed on mercury given to the mother or murse. for its climination through breast-milk is an uncertain process and an unknown quantity,

When the bones and glands suffer at an early period, the merenrial treatment ought to be combined with the administration of the todities. Potassium todide may be given to the infant in doses of from five to ten grains (three to six decigrammes) daily. Under all circum-

stances, the treatment must be persisted in for many months after the disappearance of the very last symptoms. In spite of that the consti-Intional disorder may break out again, either in its original form or as an osteitis only, leading either to caries or to sclerosis; or as a cerebral or spinal affection. That is why, when the symptoms have disappeared, recovery should not be taken for granted. After it seems to have been accomplished, the patient may be let alone for a month or two. Then the treatment ought to be resumed for the same reason that makes renewed treatment obligatory for adults; he should not be considered safe until years have clapsed without a symptom. Syphilitic arteritis, meningeal exudation, or gummatous tumor may lead to possis, nystagums, facial paralysis, hemiplegia, hemichorea, or idiotism, to myelosclerosis or transverse myelitis. A syphilitic inflammation of the labyrinth with Ménière's symptoms has been observed in a girl of five years by Knapp, and interstitial keratitis, also retinitis, appears to result from syphilis quite often. A painless otitis media was noticed by Fournier. In all such cases the energetic treatment with mercury and iodides combined must be resumed and continued for an indefinite period. But it has often appeared to me that ayphilis will do more than produce these unmistakable symptoms. There are many cases of "scrofula," chronic lymphadenitis, and rhachitis which-with no other causes to account for them-appear to point to previous syphilis not completely extinguished. In a number of my own cases I have personal knowledge of such a history. Such cases not only explain the fact that many old authors recommended mercury in "scrofula" and "rhachitis," but also that there are some in which that treatment is indispensable. Only lately I had to deal with chronic cervical adenitis, mainly of the left side, and pulmonary infiltration of the left upper lobe, in a baby of two years. They resisted the usual treatment for more than a year before the suspicion of their syphilitic nature was roused and the history of the disease elicited. Six treeks of a mercurial and iodide treatment have worked a miraculous change in the local and general condition. Besides, there are children of five or more sears that, without a possibility of arriving at a local diagnosis, remain puny, underweight, undersized and ununic, spiritless and feeble. This constitutional incompetency is sometimes one of the results of parasyphilis (Fournier); neither arsenic, iron, nor oxygen will do good in many of them. A protracted antisyphilitic treatment will fatten and strengthen them.

More than a conscientious and persistent antisyphilitic treatment is rarely required. Exceptions may be cardiac lesions; syphilitic myo-, peris, or endocarditis, or several of these forms combined, may require, occasionally, digitalis or very feeble doses of an opiate: brain and cord lesions bromides or chloral; and fevers an occasional antifebrile, for a brief period. Fever may be very puzzling, though it is more frequent in acquired than in hereditary syphilis. In the former it is quite frequent,—in from twenty to thirty-three per cent, of the cases, in the emptive stage, rarely before the fortieth day. It should be suspected in both forms of syphilis because, though it was mentioned as early as 1514 by de Vigo, and very often since, it is often not leoked for.

3. Intermittent Fever.

In older children the type is the same as in adults. We have acute and chronic forms, the quotidian tertian and quartan types. There are the same results and anatomical lessons. There are the general anemia,—in infants and children most rapid and detrimental,—the splenic tumor, the hemoerhages, and the anyloid degeneration.

It is only in newly-horn infants and very young children that the diagnosis becomes deficult. In them the type is mostly quotidian Besides, the attack may come at irregular times. Not infrequently it is seen in connection with catarrhal diseases, which appear to create a susceptibility to the poison. The chills are not easily diagnosticated. Perspiration is very frequently not profuse. The tumor of the spleen can be recognized by palpation at a late period only. but the temperature is upt to be very high. Sometimes the attack is not recognized became of the first symptom being a consulsion. Masked cases are not uncommon; intermittent pneumonia, neuralgia, even paralysis have been noted. Dr. L. Emmett Holt observed intermittent torticellis and broughial asthma, but the peribronchial lymphbodies have never been found to contain plasmodia. - a proof, it appears, that malaria is not inhaled (or possibly that the endothelial layers of the alveoli, which are believed to pass tubercle bacilli, refuse access to protozoa). Attacks of vomiting, also diarrhosa, have been noticed. For all these reasons the diagnosis is often not made. On the other hand, the diagnosis of malaria is made improperly in too many instances. In every doubtful case the blood should be examined for plasmodia. The subsequent severe anarma, as blood-cells are rapidly destroyed, is liable to be very obstinate. Among the sequelar glomerulo-nephritis, also the homoerhagic form, is not uncommon-Immunity there is, but it cannot be produced. As preventive must tires, the drinking-water should be boiled; nursing mothers should

be cured quickly, for their nilk may transmit the fever; malarial regions should be avoided; the child should sleep under mosquitonetting.

Quinine ought to be given, if the attacks come at regular intervals, in a single dose, three or four hours before the attack. That is the time when the plasmodia are small and movable. If the attacks occur at irregular periods, it is better to divide the total amount of quinine in three or four doses, to be given through the day. In the first case a dose of five grains (three decigrammes) will suffice for a child of three years; in the second case eight or ten grains (five decigrammes) will be required. If possible, quinine should not be given during the high temperature. When this lasts long, with dangerous symptoms, it should be modified by a few doses of pite-nacetin or antipyrin,—never acetanilid.

It is not always easy to give quinine because of the taste. A solution ought not to be tried for the same reason. One part of quinine sulphate may be given with forty parts of elixir simplex, but in every case the dose must be mixed just before it is taken. Enquinine is almost tasteless; its doors are like those of quinine. The newtral quinine tannate is tasteless, and may be given as a powder; but for one part of the sulphate two and a half of the neutral tunnate should be administered. The sulphate may be given mixed in chocolate -older children will take it greedily-or in coffee or syrup of coffee. When it cannot be given internally, rectal injections may take the place of the internal administration. No acid must be added to the solution; therefore very soluble preparations only must be med.-for instance, the bromide, the muriate, the histiphate, the carbonide (bimuriate with urea); or suppositories may be given, but with less positive effect than that of other modes of administration. Inunction of quinine has been recommended a great many times. The ointments made, as usual, with animal fats have very little effect. When it is impossible to use any other method, quining may be dissolved and mixed with fat and a larger quantity of landlin; but even in this case the dose which really penetrates the skin and enters the circulation cannot be determined. A subcutaneous administration of quinine becomes necessary when no other can be resorted to or when an immediate effect is required. The best preparation for the purpose is the carbomide, which will dissolve in from four to six parts of warm water, and give rise to less induration than we are liable to meet with when using the other salts. When recovery appears to be established, it is advisable to give a weekly dose of the stragfor some time.

In the chronic form arsenic, with occasional doses of quining, is the principal remedy, as in the cases of adults. A child of three years may commence with one drop of liquor potassii arsenitis (Fowler) three times a day, to be administered as detailed in a former chapter. The liquor sodii arsenatis of the Pharmacopoea may take its place in those cases in which the storach is very irritable; also the preparation of the same name introduced by Pearson, which is ten times milder than the official preparation, and must be given in proportionate doses. If the solutions of arsenic be not well tolerated. arsenous acid may be given instead. It may be administered in the shape of pills in doses of from one-bundred-and-fiftieth to enchundredth of a grain, three times a day, or more, to children of three years, or it may be administered as a powder in combination with other medicines. It may safely be mixed with hiemath, for the disagreeable order emonating from persons taking bismuth, which has been attributed to arsenic contained in it, really belongs to a minute dose of tellurium inseparable from some specimens of hismath in the market. All these preparations of arsenic may and should be given for many weeks or months. Constitutional symptoms belong mg to an overdose I have seen more frequently when using Fowler's solution than any of the other preparations; but, after all, they are rand.

Tineture of escalyptus has been given in acute, and particularly in chronic, cases. It renders good service now and then in does of from ien to twenty-free drops, three or more times a day. Methylmeblue is surreliable.

As there are very obstinate cases in the adult, so there are in children. In them, too, the spleen may remain large and the attacks return indefinitely. These are the cases which try the indurance of the patient and the patients of the physician. In them I have seen excellent results from the use of ergot these more than forty years. Ergot may be given as fluid extract, and a child of three years may take from a scriple to a drachin (four cubic centimetres) every day for weeks in increasion, or a corresponding quantity of the extract of ergot,—that is, from three to ten grains (two to six decigrammes) every day, either in mixtures or, for older children, in pills. I have noticed in a good many cases in which the fluid extract was not borne at all, that the extract of ergot, when given in the latter shape, was easily tolerated. In many cases the combination of ergot with quinine or (and) arsenic is advisable.

Subsequent anamia demands the syrup of iodide of iron and other osolicinal and hygienic treatment. Polyneuritis has been observed after malaria. It may be due to malaria toxins (proven to exist) or to those which are produced by the destruction of numerous crythrocytes.

4. Typhoid Fever.

Though occurring in the first few weeks of life, it is rare in the first year, not uncommon after the second. Most cases are met with between the sixth and the twelfth years.

Its danger may come from many causes: from previous ill health and anamia, which may depend on a feeble constitution, hereditary syphilis, chronic allments of the organs of digestion, of respiration, and of circulation; from the intensity of the invasion, which is sometimes manifested by a high initiating temperature and early septic symptoms; from an unusually high temperature; from insufficient power or actual failure of the heart; from diarrhera, intestinal hemorrhages, perforations, and local or general peritonitis; from complications such as meningitis and nephritis; and, finally, from consecutive diseases.

The incertain symptoms of the first days render the diagnosis difficult. Sometimes it is made by exclusion only. If a characteristic curve of the typhoid fever, the tongue of infectious fevers, diarrhora, tympanites, large spicen, rescola (appearing between the sixth and the eleventh days), and a positive diago and Widal test are present, it is not doubtful. It may be difficult to detect a pneumonia even after days, but after a while local symptoms will permit a differentiation. Trichinosis has been mistaken for it (Osfer in Am. Jour. Med. Sci., (800 No. 3); its pain, ordens, muscular swelling, lencocytosis up to 17,000, and large percentage of eosinophile cells (from fotty-eight to sixty-eight) should secure a diagnosis. Minary tuberculosis may be mistaken for a severe case of typhoid fever, but when it is localized in the cerebral meninges, the slow and irregular pulse, voniting, constipation, and diminished action of the kidneys secure the diagnosis of tuberenlar meningitis. There are, however, cases in which the general symptoms do not seem to agree with the elevation of the temperature and other symptoms. I know of no other serious and protracted disease in which the patients so often declare themselves to be well in spite of marked objective symptoms to the contrary. Widal's test and the diago reaction, though not always positive, and found in other diseases also, and mostly available in the second week. only, are suggestive of the presence of typhoid fever. The demonstration of the bacillus, if well distinguished from bacterium coli commine, is proof positive, but it is not yet feasible in general practice.

Preventing treatment has led to very good results. Many houses and towns which were the seats of endernic typhoid fover have been rendered immune by improving the sewerage and the general condition of the neighborhood. For typhoid fever (the bacilli being longlived) and dysentery can be traced positively to exhalations of privies and sewers, while with regard to other diseases we can only say that animal exhalations from the same sources may create a predisposition by impairing the general health, but are not able to produce specific diseases independently of other influences." When the drinkingwater is suspected, it ought to be boiled. No raw milk should be given. The faces of the patient must be disinfected, though there be no diarrhua, by crude muriatic acid, or a five-per-cent, solution of carbolic acid, or by copperas. The thermometer with which rectal temperatures are taken should be disinfected after every application The sick should be isolated when they suffer from typhoid diarrhou. and the practice, still prevalent in hospitals, of placing many typhoid patients in general wards should be abolished. The nurse attending a typhoid case should disinfect ber hands immediately before turning to another patient.

Can syphoid fever be obvoted! or, in other words, can its first stage be interrupted? An affirmative answer to this question has often been given, but it is difficult to prove the correctness of the diagroom in an alleged case of typhoid fever that lasted a few days only. While with our present knowledge we cannot believe that the proliferation of the toxin floating in the blood may be interrupted by antifermentative treatment, it is certainly either justifiable or advisable to try the effect of otherwise not injurious antifermentatives, such, perhaps, as pressone or hydrochiloric acid, if it be only for their effect on the intestinal tract. As regards the early administration of a large dose of calomel, its effect is notoriously good, no matter whether it acts as a disinfectant directly on the bacilli or whether it simply relieses the intestinal tract of the poison introduced and in multiple proliferation. A child of three years may take a doof three or four grains (two or three decigrammes); a child of eight years one of sayen or eight grains. While the purgafree effect of the calomel can be obtained by simply introducing the powder into the mouth, there to be absorbed, it is better in this case to let it be sociallowed. It can safely be given during all of the first week

A. Jacobi, The Production of Diseases by Sewer Ain Transactions of the Congress of Armican Physicians and Surgeon, 1894, and N. Y. Med. Journ. 1804.

of the disease. When, as frequently, there is constitution during the course of the disease, caloned is no less beneficial, but then it should be given in smaller doses; not enough to cause diarrhera. During the diarrhera of the second or third week it should not be given.

With regard to the general ireatment of the typhoid lever of children, we are equally liable to injure either by overactivity or by neglect. The so-called expectant treatment has its great dangers when persevered in by those who make it their invariable rule; it is safe in the hands of those only who have learned to treat the sick rather than the sickness. The air in the sick-room should be cool, the windows open. Draughts, it is true, should be avoided, but screens around the bed will permit the opening of both windows and doors. The hed-sheets must be smooth; four or eight safety-pins will fasten there to the corners and sides of the mattress. At an early period the whole surface ought to be mashed often either with water or with sleohol and water. The hair, when long, ought to be cut. children should be allowed plenty of water. Those who are liable to have dry lips and tougue must be made to drink a small quantity of either water or ellute muriatic acid in water, ten minims to the tumblerful; every ten or twenty minutes. Fissures around the lipsor in the tongue ought to be washed with a saturated solution of boracic acid, or, when bleeding, should be painted once a day with a mild solution of silver nitrate (not more than one per cent.), the ups also with an ointment consisting of boracic acid and lanolin.

Very much depends on the mode of feeding. No solid lood must be given. Boiled milk, milk on the Rutisch plan, broths, farinaceous secoctions, strained. For older children, one or two soft-boiled eggs staily, diluted in broth, either the whole of them or the white only; meat-juice, albumoses. As a general thing, more albuminoids than carlsohydrates ought to be given. The food should be such as will be digested in the stomach and small intestines, and not encumber the colon. If necessary, a small quantity of pepsin and muriatic acid may be given with it. Peptones may be given, but they must not form anything like the exclusive diet. I allow no solid food until ten days have elapsed after apprexia sets in.

The tendency to complications with hranchitis requires frequent changes in the position of the patients. They ought to be turned from their backs to their sides every few hours, and back after a while; otherwise they ought not to be moved too much. Particular care ought to be taken not to raise them too often. Physical and mental rest is an absolute necessity. Pleuritis is an ominous compliention and should be looked for early. Defecation must take place in the recumbent posture. They must not be permitted to strain. Some tepid antifermentative injections into the bowels should be made daily (thymol) to 3000).

The danger arising from high temperatures varies in different patients. Their injurious influences depend, from a clinical point of view, on many causes, foremost among which are both individual susceptibility and the length of time during which the child is exposed to its internal heat. A high temperature lasting but a certain time, and alternating with either on intermission or a remission (as, for instance, intermittent or relapsing fevers), may not prove dangerous at all, and may not require any treatment; but the frequent repetition of elevated temperatures, or their long duration, demands interference. Therefore they ought to be measured at least four times a day, particularly as typhoid fever is apt to yield two daily exacertrations and remissions.

Continued high temperatures in the course of typhold fever or intense fever at the very beginning of the disease require treatment. In them the frequency and quality of the pulse, which in the average case is relatively slow, and the functions of the nervous system are seriously disturbed at an early period. Under the influence of a short cold both both temperature and heart-bests diminish, arterial pressure increases, and the intellect becomes clear; it has a peculiarly favorable influence on the infant and child. In them the surface is relatively larger than in adults, and the cooling by radiation is more rapid and intense. Sometimes the circulation is disturbed and the surface temperature not readily restored afterwards. It may happen that the internal temperature rises while the external blood-vessels are contracted by cold, and the internal organs become engarged. In these cases a hot bath is more liable to restore radiation from the skin and reduce internal heat. Whenever no immediate reaction takes place-mainly about the extremities-after the child has been taken from the cold both, this must not be repeated, and the feet kept thoroughly warm. In such cases a warm bath is infinitely milder and more useful; or when the temperature is high and threatening, a cold pack-as detailed in a former chapter-around the trunk is preferable. At the same time the feet must be kept warm and a stimulant given. Cold applications to the heart are frequently sufficient to reduce the temperature. In such cases as develop sopor at an early period, together with high temperatures, the pouring of tepid or cool water over the head, or head and shoulders, is very beneficial. The contraindications to the use of the cold hath are general debility, weakness of the heart, cold

extremities, a cold surface complicated with high internal temperature, and intestinal hemorrhage.

The medicinal agents used to reduce temperatures in typhoid fever are sodium salicylate, antipyrin, phenacetin, and quinine. All of the medicines mentioned above must be given carefully. To avoid a possible debilitating effect on the heart, a general or cardiac stimulant should be given at the same time. All of them may be given in small doses, and frequently repeated, when the remission is not marked; but, as a rule, an occasional larger dose is preferable. Antipyrin can be administered internally, through the rectum, or, if urgently demanded, subcutaneously. A child of three years may take from five to ten grains (one-third to two-thirds of a gramme) a day, in from two to four doses, two of which have often to be given in close proximity (the second after an hour or two hours). Phenacehis may be given in doses of from one to three grains (five to twenty centigrammes), twice or three times a day, to a child of the same age. The administration of quinine follows, as a rule, the method detailed above, but in typhoid fever it is liable to disorder the stormen and intestine and produce diarrhem or tenesums. Its time is the remission, its single dose from five to seven grains (half a grainne or less), once a day or every other day, and its best indication the persistence of the splenic enlargement in the course of the third week of the disease. The combination of quinine with one of the other untifebriles yields good results quite often when one of them does not appear to be sufficient, in the same way that the effect of a tepid bath combined with an antifebrile is now and then quite astonishing. Enquining may take the place of quinme.

The intestinal tract is the seat of many dangers. Tyngunits and materixinal depend on the paralytic condition resulting from enteritis only, or from enteritis and peritonitis. The latter is either local, and corresponds with the local ulcerations, or general. Gold applications are serviceable. Enemata of ice-water will sometimes do good; or of an aromatic infusion (chamomile, amise, femiel, catnip); sometimes of turpentine, half a teaspoonful or a tablespoonful mixed with the fleid (water or soap and water). The introduction of a large catheter with one or more additional eyes may relieve the lowest part of the intestine of gas. Puncture of the inflated intestine by means of a small syringe ("hypodermic") is not dangerous in cases in which it is not required. Where it would be of service, however,—that is, in the very worst forms of intestinal paralysis, with intense and dangerous inflation,—it is injurious; for in these cases the elasticity of the intestinal wall is gote and the small punctures remain open.

I have seen faces entering the abdominal cavity through them, and fatal peritonitis, of my own making.

Diarrhea, when moderate, need not be interfered with at any period of the disease. It is probable that the initial dose of calonel presents it in a great many cases. When it is copious, such remedies as pass through the whole length of the intestine will render good service either by their soothing or disinfectant effect. Bismuth subguilate or subcarbonate, from a scruple to a draches daily (one to four grammes), is valuable. Hismath saliculate does not always act kindle in the stormeth. Naphtalin, from half a grain to a grain (three to six centigrammes) every two hours, when tolerated by the stornels, in most cases it is, improves the odor of the eracnations and diminishes their number. In many cases I have given it for its disinfectant action from the very beginning of the fever-Salol, in doses of from one to three grains every two hours, has a similar effect. Mild doses of opium may be added, from half a minim to a minim of the tincture, every two or four hours. Resortin is better tolerated than either, but it does not pass the whole tract Cold applications, covered with rubber cloth and (or) flumel, must be changed every twenty or thirty minutes. Wann applications may take their place when the little patients are unite feeble and anamic. Among the astringents, when required, I prefer lend acctate in small doses of five or more milligrammes each. Both tamin (gallic acid is milder) and alum are liable to annoy the stomach.

Countration is much more frequent in our cases of typhoid fever in both the young and old than in the descriptions of the books, both European and copied. When not too persistent it may not prove dangerous; for most children have not suffered from constinuion before the disease began, and accumulation of faces is not a very prominent feature in them. When there is peritonitis it must not be wantonly disturbed. In no case should strong purgatives be given. Castor oil in small doses may become necessary; half a teaspoonful or a teaspoonful every few hours may then be given, or small repeated doses of caloned, from a quarter to one-half of a grain. Rectal injections of tepid water, with six per mille salt, with, or mostle without, turpentine or themol, will be all that is required in most cases. But it is a good rule-a very good rule-to enforce by encmata a daily movement, or even several when the evacuations are letid. In diarrhora they will disinfect, in constitution they will relieve. It should be remembered that the condition of the faces need not correspond with that of the intestines. There may be constipation while there is alteration, and alteration without symptoms, so that even perforation may take place without previous diarrhea. On the other hand, there are cases of typhoid without intestinal fesions (Hodenpyl, Opte and Bassett), or these are very slight or very few in number, perhaps in the appendix only, or there are mere infiltrations of the solitary glands and Peyer's plaques.

Peritoritis requires absolute rest, opinin in large doses, internally or subcutaneously, together with stimulants (caffeine, alcohol, musk-), cool or cold (warm in very had, apparently moribund, very anzemic cases) applications to the abdomen, hot ones to the feet. Perforations may be met with the same treatment, but the results of laparotomy when performed within a few hours after perforation have proved succouraging.

Hemorrhages are not so frequent in the typhoid fevers of the very young as in those of adults, because of the mostly superficial character of the ulcerations. But in older children the intestinal lesions are ant to be as grave as in more advanced periods of life. No food should be given for some time, drink in small quantities only, but repeatedly. Applications of iced cloths, an ice-bag, or a lump of ice-to lose no time-to the right hypochondrium. They may be moderately heavy, for compression may have a local infinence. Hot injections into the rectum have no styptic effect; iced ones may act through reflex. Internally, alum or lead, one-quarter or one-half grain (fifteen or thirty milligrammes) or more, every hour or two hours, with opium and digitalis. Ergotin, or fluid extract of ergot, and other preparations of the ilrng which were asserted to be innocuous. I have seen to give rise, frequently, to indurations or abscesses after their subcutaneous administration. Their effect is mostly questionable. I have seen gangrene over a large surface after their use, and pyamia several times. In the case of a little girl I had to incise about sixty metastases in the course of two months. before she was saved from a pyzmia which resulted from a single bypodermic injection. The internal administration of ergot may be tried when the condition of the stomach pennits it. To combat the imminent fatal termination I have been compelled to perform transfusion of blood in the case of an adult; she recovered, but slied of a relarge on the fiftieth day. Injections of large quantities of sterilized salt water into the subcutaneous tissue (6 to 1000) yield most surprising and life-saving effects in urgent cases of utter exhaustion.

The condition of the Avert cannot but influence the course of the disease, its complications and consecutive disorders. It cannot help being enfechled by a serious and protracted disease such as typhoid

fever; still, how far this feebleness will extend cannot be predicted. Besides, it depends to a great extent on causes not exactly connected with the infection itself. Among these accessory causes are original -congenital-debility and chronic heart diseases previously contracted. Moreover, the infection itself with its accompanying fever is not to give rise to an acute myocarditis or to granular degeneration of the heart muscle. Among the symptoms of debility of the heart, which may easily lead to complete heart-failure, are pallor of the skin and of the mucous membranes, purplish and evanotic line, particularly of the lips, ears, and finger-ends, mottled appearance of the surface depending on venous stagnation in the small blood-yessels, cold extremities and nose, slow or, more commonly, frequent onlie, which, moreover, is arrhythmic, and a heart-best the sounds of which are either solit or embryocardiac,-that is, exhibiting equal intervals between the first and second sounds. In other cases the danger is indicated by the close proximity of the second sound to the first to such a degree that the former is scarcely audible.

The Ivair symptoms belonging to beart-failure are those of amenia. When beginning to treat them, we should not forget the possibility of an error in the diagnosis of the condition, which may be quite serious, because the signs of aniemia and hypersenia are in many respects the same. However, the general indications for the treatment of heart-failure may be laid down in a few rules, the first of which refers to prevention. As heart feebleness must be expected in every protracted disease, and failure feared in many, we ought to act, as a matter of prevention, exactly as the surgeon does in his sperations. Before the times of antisepsis and asepsis there were performed a great many operations that did not lead to sepais or erysipelas. Indeed, these mishaps were the minority, perhaps a small our at that. But they did occur, and that is why no surgeon would at present perform any operation, either serious or trifling, without measures to secure asepsis. If he neglected them, he would justly he held responsible for any mishap in the shape of crysipelas or promis. Now, the certainty of cardiac debility and the danger of heart-failure are much more threatening in an infectious fever than in these complications of convalescence after an operation. Therefore in no case of typhoid fever ought the heart to be left to fight its own battle maided, with the chances of being overexerted (with possible dilatation from that cause), fatigued, or exhausted. The doses of cardiac stimulants cannot be stated categorically, but the principle must be established that it is a good rule to give moderate amounts of digitalis, strophanthus, convailaria, sparteine, caffeine,

or an alcoholic beverage. The particulars have been stated in former chapters and must be left to the indement of the practitioner. Digitalis and strophanthus may derange the stomach after a while; digitalis may not act quickly enough under certain circumstances; in such a case sparteine sulphate, which is readily dissolved, alsorbed, and eliminated, in doses of one-half of a grain or more (0.03, or 0.05) every two or three hours, may be given for some time. Caffeine must not be given when there is hyperamia of the brain. Caffeine sodio-benzoate and sodio-salicylate dissolve readily in two ports of water, and are reliable aids in sudden attacks of heartfailure, in hypodermic administration. (Dose: from twenty to thirty centigrammes.) Camphor internally, in doses and according to methods described above, will answer well in either the presence or absence of pulmonary complications. In cases of emergency its suficutaneous administration works admirably in sweet almost oil. in a twenty-per-cent, solution.

Ammonium carbonate disorders the stomach more frequently than camphor is apt to do. Ammonium murate has no stimulant effect at all. Brandy and whiskey, when of good quality and well diluted (at least one in four or five parts of water or milk), hold the first rank. That they should, while sufficient doses must be insisted upon, not be given at all unless indicated, and omitted as soon as no longer wanted, is self-understood. Still, I know that they are often continued too long, and the occurrence of cirrhosis of the liver in children who exhibited no other cause of the disease except the protracted use of alcohol for alleged molicul reasons is by no means unheard of. Champagne will often take the place of brandy and whiskey when speedy stimulation is required, or Tokay, Madeira. sherry, or a California wine when the former are objected to because of their taste. When there is diarrhosa, opium given in small dosesperhaps one-quarter of a minim of the fincture every hour or every two hours to a child of three years-will art both as a cardiac stimulant and astringent. Of musk as a powerful stimulant I have seen the best possible results. Nitroglycerin in doses of a two-hundredth or one-handredth of a grain, repeated frequently until four or six doses have been taken, will be found a vigorous remody when, while the heart is still acting, the arterial pulse is flagging.

Whatever medicines may be found desirable, the child should be leept absolutely quiet. In a recumbent posture it must remain, as a rule; thus the food has to be given, thus it has to be carried to the window or into the open air, if circumstances permit. Many a case that looked like being near extinction within the four wallswill exhibit a wonderful improvement on the lawn or under sludetrees.

Besides, the surface must be kept warm. It is principally the extremities which require external heat. A hot bath, without or with an aromatic addition, and hot injections into the bowels will do a world of good in many a desperate case of collapse, always provided the manipulations required are absolutely gentle and not exhausting.

To relieve inflammatory complications of the front in typhoid fever the hair ought to be out very short, the head bept high and washed frequently, or water may be poured over it while the body and throat are protected by an India-rubber cloth. The application of ice-water directly to the head in small children is not tolerated for a long time. It may give rise to collapse, and should be watched carefully. While the head is to be kept cool, the feet must be kept warm. Mustard foot-boths and hot applications to the feet, cold water or an ice-bag to the beart, an ice-bag around the neck, will be found very comfortable. When there is the slightest brain complication not depending on the infection stself or anzenia, so alcoholshould be given, no opinm, and no caffeine, though they may appear indicated by the condition of the heart. It is rarely necessary to resort to local depletion when the meningitic symptoms are quite clear. In these cases feeches may be applied to the mustoid process or, better still, to the septum mirrors. When the brain symptoms belong to the infection alone or to animia, opinm is, however, will tolerated, and refieres sleeplessness and the general irritability. Now and then codeine may take its place, or anytene hydrate, chloral hydrate, or sulphonal. Sometimes the subcutaneous injection of morphine-one or two minims of Magendie's solution-will give instantaneous relief. Warm bothing will prove beneficial in such conditions of general excitability. In these cases the use of cold must be carefully avoided. It is understood that all such measures are meant for exceptional cases only. Mild cases will take care of themselves without them. But insidiously chronic diseases of the brain and spinal cord, such as insanity or ataxia, may come on Neuritis should be looked for. An owner of prevention may save your patient.

During convolencessee sudden changes in feeding must be avoided. I repeat, it is dangerous to give other than fluid that before the tenth day after the Sever has disappeared. After that time white means plain poddings, and jellies may be added. Raw fruit must not be given under any eirconstances. Patients should not be taken refl

Older children should not be allowed to read. No visitors should be admitted thring the early part of convalencence; neither the heart nor the brain bear any strain. The body temperature and the movements should be matched very carefully, for relapses may occur. Such relapses are very frequently the result of improper food, which will irritate the intestinal ulcerations, the process of whose bealing is thereby interrupted. The greatest care must be taken in those cases in which the spleen, when turnefied during the progress of the disease, does not nearly assume its normal size about the modele of the third week. When it remains large, a relapse may be looked for.

The large number of consecutive diseases which may result from typhoid fever is ample proof that all such measures are by no means superfluons; multiple abscesses of the muscles, outritis, epiphysitis, and arthritis are not very uncommon after typhoid fever. Norm is now and then seen, but it is only just to state that epophysicis and arthritis are not so frequent after typhoid fever us, for instance, after scarlet fever, and noma not so frequent as after measles. But purpura may remain behind. Parotitis is not very uncommon. Thrombiin the extremities are sometimes met with. Erysipelas, laryngeal perichondritis, and cutaneous gangrene are by no means rare. But it is certain that many of those occurrences can be avoided if greater care be taken during the progress of the disease. The kidneys suffer in typhoid fever as they do in most infectious fevers, and frequently at an early stage. The majority of such consecutive cases of pephritis are mild and run a favorable course. Bud cases will be considered below.

Among possible complications—not only as the pretext of an uncertain diagnosis—we frequently hear of that with malaria. Whether typho-malaria is a disease sui generic, as Manson says he has seen in China, may be intertain: but there is no reason why plasmodia and bacilli should not be co-ordinate and co-operative. It have seen such eases. Having met with cases which appeared to permit the two diagnoses, and mainly such as ditring and after a clear course of typhoid fever developed regular attacks of chills and fever, I have administered quining for some time. Several times these attacks appeared to be quite grave, and were mostly obstinate.

The paratyphoid fever described by Gwyn. Schotmailler, and Meltzer, without Widal reaction, and with a bocillus more nearly related to the colon than the typhoid bacillus, offers no new therapentic indications.

5. Typhus. Relapsing Fower. West's Disease.

The hygienic and therapeurical measures to be taken in (petechial) exanthematic typhus are in part like those of typhoid fever. Fresh air, hydrotherapy, plenty of water, some alcohol, as few antifebrile medicines as possible, and heart stimulants when indicated, comprise the treatment. Consulsions are not rare, conjunctivitis, laryngitis, and capillary broughtis frequent. But the duration of the illness is much shorter than that of typhoid, and the prognosis is better in the child than in the adult. As there are no intestinal symptoms, feeding need not be exclusively fluid during recovery.

Relaying /ever permits of solid food in the intermissions. The spleen, when very large and sensitive, requires ice applications. Complications with eye or ear discusses have their own indications. Quinine appears to do very little. Indications should be met as they appear.

Of Weil's disease (lever, large liver and spicen, icterus, nephrins, delirium, coma, erythema, labial herpes) even Baginsky has seen hut a single case ("Lehrbuch," 5th ol., p. 214).

6. Epidemie Cerebro-Spinal Mexingitis.

It is both endomic and contagious, and demands absolute isolation and exclusion of brothers and sisters from schools and public playgrounds, also rest both of mind and body from the very beginning and for weeks or months after recovery. Though the prognosis of those cases which do not terminate farally in the first twenty-four hours, and in some of which not even a differential diagnosis can he made with certainty, he much better than in the different forms of cerebral meningitis, the long duration of the disease endangers the result. Noise and glaring light must be excluded, no muscular exertion permitted, the neck supported; in had cases of hyperasthesia the bedefothing should not be permitted to touch the body. Hot buthing, once or twice a day in the beginning, may be tried to advantage. Lumbar princture, formerly used for diagnostic purposes only, may do good, but cannot have the same effect as when the exudation is altogether serous. The urinary bladder may require emptying. Leeches applied to the painful spine will do some good in the very early stages; an ice-bag, on which the neck must be made to rest comfortably, another one to the occipat, and a purgative dose of calonici ought to rather in the remedial treatment. Unless contraindicated by great sensitiveness, mercurial ointment externally and potassium iodide internally are expected to do good. The latter is

generally given in too small doses, and thus misses its effect; from three to five grammes (forty-five to eighty grains) daily, and more, are easily tolerated, and are required by a child of five years. It may be preceded by a purgative dose of calomel; altogether, it is necessary to keep the bowels open. Much handling, however (enemata), is mostly contraindicated on account of the pain and convolsions caused thereby. Stimulants are contraindicated, certainly in the first period of the illness. The diet of the acute stage should be milk, cereals, and fruitinices. Bromides will quiet excessive restlessness (doses of from one to four grammes a day); there are, however, very few cases that are not greatly benefited by sufficient doses of opiates or chloral to insure comfort and sleep. Sinapisms should be applied for a few minutes. at a time, and frequently repeated; in the later stages a vesicalors over the cervical part of the spins is indicated. I am not pleased with the effects of tincture of iodine or iodoform ointments. Salieylic acid and salicylates have been praised; but I am afmid that the cases in which their good effects were observed were those of mistaken diagnoses; for, indeed, rheumatism both of the unseles and the meninges has been taken for different forms-even the very gravest-of meningitis. The after-effects of the disease, particularly paralysis and contractures, are difficult to handle; their treatment does not call for any special measures dictated by the original disease. Deafness originating in the labyrinth or in the acoustic nerve is liable to prove permanent, in spite of hydrotherapy, diaphoresis, and electrotherapy. Amblyonia from inflamination of the chiasena and the optic terves gives a had prognosis; keratitis and panophthalmitis are serious. The actual cautery has been used extensively. In the acute stage of the disease it is useless or harmful; in the chronic it has been known to do good, and may be applied regularly.

The modern progress of our acquaintance with the etiology of infectious diseases adds to our preventive, not yet to our curative powers. H. Jaeger (Zeitseh, f. Hyg. ii. Infect., vol. xix. p. 351) asserts that sixty per cent. of all cases of cerebro-spiral meningitis are connected with or dependent on the pneumococcus (and diplococcus intracellularis?). This explains the frequent complication with pneumonia. Thus, the mosal secretion in which the diplococcus is of frequent occurrence requires particular attention. Indeed, as early as 1888 the Prussian government ordered the disinfection of lines—mainly handlerchiefs—from this point of view. For the same reason the violent aspiration of the maso-pharyngeal secretion, for the purpose of expectoration, may prove unfortunate for the individual and, secondarily, for the community. Weichselbaum, Heubner, and

Furbringer charge the meningotoccus intracellularie with heing the came. This microbe may also penetrate into articulations and give rise to a sero-fheirous excidation, which, like the cerebro-spinal, but a tendency to absorption and recovery, different from the termination of those forms of arthritis which depend on streptococci and staphyliococci.

7. Glandular Feber.

Under the name of " glandular fever," Pfeiffer (1887), A. Seibert (1894), L.P. West (1895), and Danson Williams (1897) described a complex of symptoms which is claimed as a well-characterized disease ant generis. Patients were from seven months to thirteen years old (Dr. Seibert's case fourteen). Parotids not affected. West's ninety-six cases occurred in forty-three families within three years. none during the summers. Many of the families lived at a distance from one another, but exposure and contagion could be proven in the majority. Incubation mostly seven days (Williams's five to seven. also fifteen days, mostly seven). Williams also observed many cases in the same family. The disease begins with anorexia malaise, sometimes vomiting, some slight diarrhost, after some days dyspłagia There is (Seibert) no pseudo-membrane in the throat, no pharmgitis; in a few cases opisthotones, which is explained by the swelling of the lymph-nodes. Fever moderate, in some cases temperature (Seibert) normal in the morning, 104" F. in the evening. Some abdominal pain, diarrhos in milder cases, constitution in more severe ones. No sequebe and no second attacks in West's cases. The disease lasted up to six weeks, in West's cases sixteen days, in Williams's from four to twenty-seven, with an average of sixteen; one death in ninety-six cases (West), one in twenty-four (Scibert). The main symptoms were the swellings of lymph-nodes, rarely of one side, mostly of both, beginning, however, on the left side; the right side followed in a few days. The glandular swellings extend downward and forward from the angle of the jay and can be felt distinctly and separated from one another (West). The number of these swellings varies from four described by West in many small hard nodes, distinctly palpable, mostly between the deepseated amuscles of the posterior half of the neck (Seibert). Posterior cervical, axillary, and ingrined lymph-nodes could be felt in seventy-five per cent, the mesenteric in thirty-seven cases. The liver was found enlarged in eighty-seven cases the Williams in ninety per cent.), the spleen in fifty-three cases (by Williams In fifty per cent, by Seibert in mone), the truckeo-broachial glands in

all of Williams's cases. There were no ordenia, no suppuration, no permanent enlargement. In the discussion of the Pediatric Section of the New York Academy of Medicine, Kopfile (who never saw a case in his many thousands of observations) suggested the possibility of an intestinal infection because of the fact that the local symptoms started on the left side. The reports regarding the existence of an incubation and the occurrence of contagion cause me, for the present, to connect the affection here with infectious diseases of a special type. The treatment should be mostly symptomatic; the (streptococcus?) invasion seems to find its spontaneous termination. But there may be a transmission to the rures and antra, also occasionally a latero-pharyngeal abscess.

8. Cotorrhal Ferry.

This is not the "ephemeral fever" of a feverish infant or child the cause of which has not been diagnosticated, for the result of overleaded stomach or of intestinal patteraction, nor of cocci in the throat or nose, but of the reflex irritation depending on "cold," exposure to a cold temperature, or to a sudden change of temperature from bot to cold, particularly while the skin is perspiring. chill is noted in the beginning, or merely a high temperature, aching unucles, anorexia, headache, perspiration, and some catarrhal angina; in other cases very slight elevation of temperature and little perspiration but fassitude, sleepiness, and constitution. Labial herpes is apt to appear on the second or third day and a copoous perspiration is frequently noticed on the fourth or lifth day, after which, with plenty of urates in the urine, improvement takes place. To speak of a gastric, becatie, or cerebral variety, in order to donote the most prominent symptoms, is superfluous. The treatment consists in rest in bed, at a temperature of from 65° to 75° F., plenty of water (preferably hot). or of hot lemonade for older children, a purgative (ol. ricini), tinct. accuiti in from one-quarters to one-half-drop doses every hour or every two liours, liquor ammonii acetatis from three to ten drops every two hours in hot water, and, if there be much headache and a high temperature, phenacetin in from one-half- to one-grain (0.01 to 0.06) doses from time to time.

9 Ariatic Cholera

It is almost always fatal in the infant, and little less so up to the fifth or sixth year. Its diagnosis is, during an epidemic, secured by the presence of the characteristic diarrhea and veniting, with cold extremities, cyanosis, algority, and the absence of pulse and of urine; lastly and positively, by the presence of the comma bacillus in the fecal discharges. The differential diagnosis should be made from arsenic and tarrar-emetic poisoning, also from very acute nephritis. The latter way exhibit the same copious rushing "rice-water" discharges of serum with masses of epithelium.

As the disease is identical with that in the adult, so the general features of the treatment are the same. Preventive luminization has been practised, after many previous attempts made in vain, lo-Haffikin. If his favorable results obtained in the East Indies are confirmed, and the Mecca pilgrimages closely watched, the world will be threatened with one less danger. During the prevalence of an epidenic no child should be permitted to suffer either from diarrhox or from vomiting. Wet or soiled lines must be disinfected and boiled immediately. Whatever is to pass beyond the lips, month-wash or food or drink, should be boiled. Invalid or dyspeptic children should be sent away, and the schools closely watched for the slightest attack of loose bourds. A child suspected of cholera is to be kept in bed, with small hourly doses (five or ten milligrammes) of caloned, which ought to be continued until the faces show the characteristic color. Creosote may be given in seater, in moderate doses only, for the iddness are apt to suffer; salol in doses of from five to fifty centigrammes every few hours. Diluted hydrochloric acid (1 to 500) as a drink after the administration of calonel has been stopped. The extremities should be kept warm, the abdomes, if hot and tender, covered with cold applications, which should be changed when they become warm, and stimulants given freely (alcohol, coffee, caffeing strychnine, camphor, tincture of musk), subcutaneously if, or lacause, the stomach retains nothing. Warm bothing with friction while in the bath; the bath water should be boiled before being used. to destroy the comma bacillus, if not its toxins. No internal diaphoretics, and absolutely no pilocarpine subcutaneously. heart is too feeble, even when the condition appears to improve. sudden relapses and collapse may ensue. The enteroclysis of Cantani (the irrigation to be carried up as far into the bowels as possible) is made with a solution of three or five parts of tannic acid. in a thousand of searm, or hot, water. The action of the heart may be re-established by subcutaneous salt-water infusions. For these Cantani's original prescription contained four parts of sodium chloride and three of sodium bicarborate in one thousand of water. Opium is badly tolerated in all stages. High temperatures and delirium demand cold to the head; pneumonia, parotitis, nephritis, and other complications furnish their own indications.

10. Dysenlery.

It is communicated from person to person, but by fecal discharges only; by the use of the same chamber, for instance. Indeed, all the baculary diseases of the intestinal tract may enter through the anus. Privies and sewers are sources of dysentery, as of typhoid fever; but a more frequent cause is the drinking of water infected by sewage, which need not always contain specific microbes. Their toxins suffice. Americe, which were believed to be very rare, and the came of a specific variety, are probably concomitants of most cases. The catarrhal, the follicular, and the diphtheritic varieties may run their courses separately; in many instances, however, the first will only be the initial stage of the more serious forms. The treatment is not, for the present, influenced by the species of microbes causing or complicating the malady, bacterium dysenteriae, diphtheriae, coli, or americe.

To prevent contagion, a patient with dysentery should be isolated. During the heat of the summer children should be protected against colds (the systematic external use of cold water is, as always, the best prophylactic) and unripe fruit.

The sufferings from dysentery are so intense, and the dangers from its acute (fever, convulsions, exhaustion) or chronic (scursy, nonsa, nephritis, paralysis, neuritis, diseases of joints, abscess of the liver) state so threatening, that active measures should be taken at once. A brisk purgative ought to precede every other treatment. Castor oil in sufficient quantities, or calonel—according to age—in doses of from one to eight grains (0.05 to 0.5), will have a favorable effect, the latter acting both as a laxative and a disinfectant.

The food should be fiquid, milk and strained farinaceous decoctions the exclusive diet for the first acute stage. It is on the general condition of the patient that the administration of other articles of food, such as jellies without sugar, beel- or mutton-broth with farinaceous decoctions, egg allowin, or alcoholic and medicinal stimulants (either general or cardiac), will depend in the course of the disease.

Great sensitiveness of the left hypogastric region and local heat will be alleviated by the application of ice. Very young infants, however, bear ice but a short time, whether applied to head or abdomen. I advise to watch the effect of the application of either the ice-bag or the ice-cold cloth. Now and then, even in adults, we meet with an individual intolerance of cold which must be respected. Indeed, quite often warm applications of either water or poultices prove more efficient in regard to the two indications, which consist in alleviating irritation and reducing temperature

Bismeth subgallate and subcarbonate not only cover and protect the mucous membrane, but have also a decided antifermentative effect. Thus bismuth is surely indicated in irritated conditions of the mucous membrane: it seldom fails when given in sufficient doses. There is no barm in sometimes giving it in such doses that part of the introduced material will pass through the entire length of the intestinal tract without undergoing decomposition. As its taste is not disagreeable, it may be given together with tannin (gallic acid is better) and opium; the daily dose reght not to be less than our dirachin on a drachin and a half (40 to 60). At the same time the passages ought to be examined as to their reaction. Abundant wisl, so frequently found in the slightest intestinal anomalies, requires the additional administration of alkalies. Boiled milk should be mixed with equal parts of lime-water. In most cases carbonate of lime is perferable to either magnesium or sodium carbonate or bicarbonate. the sales of both of which are apt to increase marrhosa. Sometimes, particularly when the stomach can be relied upon, sodium salicylate may be added to the internal treatment. Besides the favorable effect of the sodium on the intestinal tract, the salicylic acid may prove beneficial both by its antifebrile and disinfocunt action. Salol, about one or two grains (6:0) or 0.15), or resorcia, one-quarter or one grain (0.015 or 0.01), given every two hours, may take its place The latter is better tolerated than the former, but saled has a better chance to reach the lower part of the intestine.

Opinm and its alkaloids are invaluable in the treatment of intertimal ofcerations. The objections to their use are decidedly exaggerated. Such accidents as have been reported in isolated cases as resulting from the administration of opium are to be attributed to the fact that the dose was either absolutely or relatively too large compared with the idiocyncrasy of the patient. Dysentery both requires and tolerates larger doses of opium than an average diarrhem, no matter whether the latter be the result of catarrh or alceration of the small intestine or the crecum or the upper part of the coloni-In this respect dysentery stands almost abreast with peritoritis. The main indications are to relieve pain, reduce peristable, and diminish the copious serous secretion; no other remedy fulfils all of them so well. For these purposes it ought to be given internally; for enemala containing opium may act favorably, but the more intense the teresums and the greater the hypermunia or the more extensive the electrotion the less reliance can be placed on their effect, and the amount

Among all the opiates I prefer a tineture, or the usine, or opium in substance, or Dover's powder; rarely have I injected morphine under the skin. The effect of the drug is easily watched and controlled by commencing with moderate doses, not repeating them too often, and being guided by the effect obtained. If opium is to be discarded, optum with hyoscyamus, or with belladouna, or hyoscyamus or belladouna alone, may take its place temporarily. Severe tenesmus may require the painting of the protruding part with Magenilie's solution.

Astringents may be given either in combination with opium or separately. They are expected to pass wholly or partly through the entire length of the intestinal canal, thus coming into contact with the inflamed and ulcerous nucous membrane. Among those eligible are (tannin) gallic acid and vegetables containing the same (ratambia, cateclin), besides lead subacetate, silver nitrate, and pernitrate of iron.

The daily dose of gallic acid, when it is to be taken for a long time in succession, is from five to fifteen grains (0.3 to 1.0), lead schacetate one to five grains (0.05 to 0.3), silver nitrate one-fourth to one-half grain (0.015 to 0.03). The latter ought not to be given more than a neek or two in succession, for fear of argyria, two cases of which occurred in my own practice, and of my own making, many years ago. All of these medicines, except gallic acid, are best taken, if possible, in the form of pills. They appear to be better tolerated, and are certainly more effective. Silver nitrate in solution (distilled water) demands a bottle of neutral color and administration from a glass or chira vosel.

Another antiseptic which I have frequently administered internally in every description of intestinal ulcerations, in both the acute and the chronic forms, is naphtalin. For its doses and the methods of its administration, and some account of its effect on intestinal ulceration in general, I refer to the article on typhoid fever. We expect a great deal from such topical medication, and it appears that it will be one of the great aids in all infectious diseases whose principal localization is in the intestine, as, for instance, Astatic cholera.

Adults will take from fifteen to seventy-five grains (10 to 5.0) daily, in powders, capsules, or mucilage. Children hear, as a rule, according to their ages, from one-half of a grain to two or three grains (0.03 to 0.2), every two or three hours, in some mucilaginous substance. Some do not hear it well, but when such is the case the

stomach will give warning at once. Its odor, it is true, is objectsonable.

The temperature will rarely be so high as to require antipyretic medication. Frequent elemata will often reduce it effectively. Very young infants may require an occasional dose of antipyrin or phenacetin when the heat threatens either the nervous system or the normal structure of the tissues of the body. A warm both will often do better than either.

Consecutive paralysis requires a mild galvanic current in the beginning. The daily application both to the spinal cord and the extremities need not exceed ten minutes; the electrodes should be large, and the current reversed after five minutes. After a few weeks the interrupted current may be added the same length of time, but it should be applied to the paralyzed muscles only. Together with the latter, stryclmine or (and) phosphorus may be used, in daily does of one-thirtieth of a grain (0.002), in the case of a child of four or free years; the former is more effective when used subcutaneously.

The local treatment of chronic dysenteric ulcerations requires the use of enemata. Their indications wary. They are to evacuate the bowels, or to reduce the irritability of the diseased intestine, or to accomplish a local cure. These indications cannot be fulfilled separately; sometimes two, sometimes all three, may be not at the some time. The nature and quantity and the temperature of the liquid to be injected depend in part on the end aimed at, in part on the irritability of the individual intestine. Sometimes the bowel objects to the introduction of small amounts; sometimes, however, large quantities are tolerated very easily indeed. To introduce small amounts, the selection of the syrings is a matter of indifference, provided the liquid enters the bowel gently and without pain. To inject large quantities, undue pressure and local irritation should be avoided. Therefore the fountain stringe alone will answer; it ought to hang but a trifle above the level of the amis,-say from six to twenty inches. The temperature of the liquid is not always a matter of great importance. Some recommend the injections to be ice-cold: some, however, tepid; both are frequently recommended as paraceas-But the practitioner will soon ascertain that some bear and require the one, some the other; some, indeed, very hot ones.

In my experience, for the large majority of patients suffering from either acute or chronic dysentery, tepid injections answer best. Not rarely the intestine is in such a condition of irritation that even small quantities of a very cold fluid are expelled at once. And again,

there are cases in which enormous amounts of either cold or warmwater are readily received. To accomplish the purpose of evacuating the bowel, plain water will often suffice, but three-dourths-of one-per-cent, solutions of salt in water will usually prove more acceptable. Additions of potassium bitartrate or castor oil have proved so uncomfortable in my cases that I discarded them long ago. However, when the secretion of mucus on the rectal and intestinal mucous membranes was very large, one- of two-per-cent, solutions of sofium hicarbonate answered very well indeed. For the purpose of clearing the intestines, either of faces or the morbid products, a single enema is insufficient. It ought to be repeated several times daily. When much mucus is secreted and tenesmus intense, it may be applied after every spontaneous evacuation. In many cases the substitution of flaxseed bea or mucilage of gum acacia will prove advantageous. I have had to continue them for weeks for both their evacuating and alleviating effect. When, however, the latter alone is aimed at,-that is, when tenesimis is to be relieved,-small grantities will usually suffice. An ounce or two of thin mucilage, or starch-water, or flaxseed tea, with fructure of opium or, better, extract of opiem, proves very comforting. Glycerin in water has been recommended for the same purpose. The former alone, or but slightly diluted, irritates, ray, cauterizes. It will require close judgment and individual experience to ascertain the degree of dilution, if it be used at all. In these cases I avoid it.

When a local curative effect is aimed at, injections of small quantities are sometimes insufficient. As the local losions are often extensive, the amount to be injected must be pretty large. Astringents are almost always required. Zinc or aluminum suiphate, lead subaretate, silver nitrate, tannin, potassium chlorate, ergotin, salicylic and rarbolic acids, and crossote have been recommended. Of the more common astringents I prefer alumina or tannin in less than one-percent, solutions. Salicylic acid resulted more frequently in pain than in benefit. Carbolic acid, in solutions of one-half of one per cent, has proved very beneficial, but I have learned long ago to be very careful in regard to its administration because of its detrimental effects, particularly on the kidneys of very young patients.

Injections of silver nitrate may prove very meful in cases not quite acute. Before the solutions of a quarter of one per cent, or of one or two per cent, are injected, the intestine ought to be washed out with warm water (without salt) or with a two- or three-per-cent, horacle acid solution. After the injection has been made, it ought to be neutralized with a solution of sodium chloride; it is still better to wash the arms and the portion of the rectum within may reach with that solution before the medicinal injection is made. For even the mildest solutions, when acting on the scre splaincters, are liable to give rise to intense tenesurus when no such care has been taken.

When the ulcerations are few, or in the lower portion of the bowels only, small quantities suffice; but extensive lesions require large injections, the patient being on his side or in the lanee-elbow position. For older children the notate of the fountain syrings should be lengthened by attaching to it an elastic catheter, which is introduced as high up as possible, after the same plan that mitrient enemina are to be given. In a number of cases, both mild and severe, in which neither the usual astringents nor silver nitrate appeared to answer, I have been very successful these thirty years, when resorting to injections of bismoth subcarbonate. The drug is mixed with the or twenty times its amount of water; of this mixture from one to three ounces (300 to 1000) are injected into the bowel, which has been washed out previously, twice or three times thatly. The result is satisfactory, though a large portion of the injected mixture be soon expelled.

Suppositories containing the above substances may prove hereficial: but in order not to irritate they must be so soft as to melt readily. They may always contain some opinin: but its admixture is not always sufficient to relieve the irritability of the rectum. Indeed, to accomplish this end opinin must at least begin to liquidy and to be absorbed, and absorption cannot be relied upon except where a part, at least, of the outcome surface is in a fair state of integrity. When no suppository is tolerated, and the administration of an opiate to the intestine is indicated, painting with Magendie's solution or the injection of a small quantity of olive oil with tineture of opinin may be tried. The local application of occaine relieves pain, but the drug is readily absorbed, and great caution should be used in its administration because of its poisoners effects.

11. Sterletina

Preventive measures of the strictest nature are indicated in regard to no disease more than to scarlating. Its mortality is very great, in some epidemics even excessive: and when the child survives, there may be a large number of soquely which either terminate fatally or in persistent injury to health and in the curtailing of the enjoyment or usefulness of life. Among these are cardiac diseases, glandular affections, supportative offits, and nephritis. The first attack of the latter is not limited to the second or third week, when, it is true, it is mostly met with; for I have seen it appear on the thirtyseventh and on the fifty-second day of the disease. Banmler reports the case of a whild with hemorrhagic nephritis which started as late as the forty-fourth day of scarlatina.

There is another momentous indication for strict prevention. The liability to attack is by no means so great as, for instance, in measles. It is but rarely that any of the young inmates of a house escape contagion when measles has attacked one of them. The virus of scarlatina, however, is less catching. Infants of less than a year suffer but seldom, though very severely when taken. The vast majority of those affected, however, are less than five years old. After that period susceptibility becomes less from year to year; so that, indeed, a child that has been protected against scarlatina during its first half-dozen years attains a certain degree of immunity for the inture.

The efficacy of the virus is so persistent, and clings so long to clothing, bedding, and furniture, that it can be carried and transmitted long distances by persons, towels, toys, letters, and even domestic animals and articles of food, principally milk. It is transferable through the whole duration of the disease, from the incubation to the disappearance of the very last trace of desquaration, and perhaps later: even before the appearance of the eraption. The incubation of scarlatina may last but a few hours, like that of diphtheria and erysipelas, or as long as nine days; in this it differs greatly from measter, variola, and varicella. The last symptoms may not disappear until long after the fortieth day, which, it is true, is the average termination. The fine desquaration of the second week may have terminated entirely, but the gross peeling, particularly of the hands and feet, extends frequently to the end of the seventh or eighth week. It carries cortagion as well as the designamation of the former weeks, or as the breath of the patient, or his expectoration in the earlier periods. So slow is sometimes the process of elimination that Spottiswood Cameron asserts that the end of the disease is seldom reached before the eighth week, and not always in the thirteenth Whether the urine or the alvine dejections of the patient can spread the fliwase is not quite certain; but so long as there is an uncertainty they ought to be treated as dangerous elements and disinfected and removed.

Sore surfaces appear to admit the poison. Scarlatina will enter through the integrments denuded by ecrema. I believe that I lost, many years ago, two patients because I operated upon them during the prevalence of an epidemic of scarlatina. A child of four years, on whom I resected the head of a femur, was taken with the emption on the fourth day and died. Another one was stricken down thirty-six hours after the resection of a tousil. In both cases I had reason to believe that I opened on inroad to the poison. Indeed, catarrhal or otherwise sore tousils—even healthy tousils with the normal interruptions of their epithelial covering—are very likely to furnish a means of invasion. Several times I observed scarlatina a few days after tracheotomy.

Dispensaries and schools are the hotbeds of scarlatina. A single case waiting in the anteroom of a public charity until it is seen and diagnosticated may destroy a dozen innocents while craving the blessings of public beneficence. Schools ought to be closed during an epidemic as soon as a few cases have appeared. No child coming from a house with scarlatina must be admitted. Such as have been removed from the dangerous neighborhood and not exposed since may, after thorough disinfection of the clothing worm during the time of exposure, be allowed to return after an interval of ten days.

The shilly school inspection of the New York Health Department, organized a few years ago, after the profession had urged its necessity from time to time these thirty years, cannot fail to be very beneficent, and is among the best methods to improve public health employed by the health department of the city. There cannot be a doubt as to its example being imitated in other places. The "inspectors are to carefully examine each pupil that has been set apart from the other pupils by the teachers of the school, and cause to be excluded from schools all those affected with, or showing symptoms of, any ountagious disease, more especially the following: measles, diphtheria. scarlet fever, croup, whosping-cough, mumps, contagious eye diseases, parasitic diseases of the head and body, or any illness which, in their judgment, shall require the pupil to be excluded from school."

The intraction of the patient with pork, vaseline, and similar substances adds to the safety of the attendants by preventing the carrying into the air of the eliminated particles of epidemnis. Soaping and hathing contribute to the same end, but are not perfectly reliable safeguards because the virus penetrates the whole skin down to the rete Malpighii.

The sick and their attendants must be strictly isolated; during the winter, when the warm air rises and carries contagion with it to the upper part of the house, in the highest story. Whoever enters the sick-room—friend, nurse, or physician—ought to wear special clothing while inside, or at least a linen or India-rubber cover. The physicism should disinfect his hands after leaving the patient. In the room the air ought to be changed often. Draught can be avoided by means of screens. No dry linen or clothing must leave the room. It should be soaked in water or, better still, in a disinfectant fluid before it is carried off, and beiled in scop and water immediately after arriving in the laundry. The same rules which hold good in the cases of infectious and contagious diseases in general, and those which refer to the disinfection of the room and firmiture and public vehicles which may have been used, must be obeyed to the letter. No room, in fair weather, will afford the same safety as a tert would, and in no disease, with the exception of variola and diphtheria, is the erection and maintenance of special hospitals more needed than in scarlating.

In connection with the question of prevention of contagions diseases, scarlatina and others, I cannot render better service than by giving the greatest possible publicity to the directions of the New York Health Department. They contain all that is known and all that ought to be done, in city or country, to prevent scarlet fever, diphtheria, and measles in the present state of society and of our knowledge.

"DIPRTHERIA, SCARLET FRUER, MEASLES.

"These diseases are very contagious. Diplitherta is usually transmitted from the sick to the well by the moist or dry discharges from the nose and throat of the sick person. Scarlet fever and measles are transmitted by the discharges from the nose and throat and also by the scales thrown off from the surface of the skin. These discharges and scales contain the minute germs that cause these discharges and scales contain the minute germs that cause these discauses. The importance, therefore, of their proper disinfection can be at once understood.

- "DIRECTIONS TO PREVENT OTHER CASES OF DIPHTHERIA, SCARLET FRAME, AND MEASLES OCCURRING IN A FAMILY WHERE ONE CASE. EXISTS.
- " i. If possible, one attendant should take the entire care of the sick person, and no one else besides the physician should be allowed to enter the sick-room. The attendant should have no communication with the rest of the landly. The members of the family should not receive or make visits during the illness.
- "2. The discharges from the nose and mouth must be received on handlerchiefs or cloths, which should be at once immersed in a

carbolic solution (made by dissolving six ounces of pure earbolic acid in one gallon of hot water, which may be diluted with an equal quantity of water). All handkerchiefs, cloths, towels, napkins, bedlinen, personal clothing, night clothes, etc., that have come in contact in any way with the sick person, after use should be immediately immersed without removal from the room in the above solution. These should be soaked for two or three hours and then builed in water or soapands for one hour.

- 3. In diphtheria and scarlet fever great care should be taken, in making applications to the throat or mose, that the discharges from them in the act of coughing are not throam into the face or on the clothing of the person making the applications, as in this way the discase is likely to be caught.
- "a. The hands of the attendant should always be thoroughly mainfected by washing in the curbolic solution, and then in coapoids, after making applications to the throat or nose, and before eating.
- "5. Surfaces of any kind soiled by the discharges should be immediately flooded with the carbolic solution.
- "6. Plates, cups, glasses, knives, forks, spoons, etc., used by the sick person for eating and drinking must be kept for his especial use, and under no circumstances removed from the room or mixed with similar utensits med by others, but must be washed in the room in the carbolic solution and then in hot scapsuds. After my the scapsula should be thrown in the water-closer, and the vessel which contained it should be washed in the carbolic solution.
- "7. The room occupied by the nick person should be thoroughly sired several times daily, and swept frequently, after scattering wet newspapers, sawdast, or tea-leaves on the floor to present the dast from rising. After sweeping, the dust upon the wood-work and furniture should be removed with damp cloths. The sweepings should be berned and the cloths scaked in the carbolic solution. In cold weather, the sick person should be protected from draughts of air by a sheet or blanket thrown over his bead while the room is being aired.
- "8. When the contagious nature of the disease is recognized within a short time after the beginning of the illness, after the approval of the Health Department Inspector, it is advised that all articles of furniture not necessary for immediate use in the care of the sirk person, especially upholstered furniture, carpets, and curtains, should be removed from the sick-room.
- "c. In scarlet fever and measles, when the potient is beginning to recover and the skin is peeling off, the body should be washed once

daily in warm soapsuds, and afterwards anointed with oil or vaseline. This should be continued until all roughness of the skin has disappeared.

"10. When the patient has recovered from any one of these diseases, the entire body should be halled and the hair washed with hot scapouds, and the patient should be dressed in clean clothes (which have not been in the room during the scieness) and removed from the room. Then the Health Department should be immediately notified, and disinfectors will be sent to disinfect the room, bedding, clothing, etc., and under no conditions should it be again entered or occupied until it has been thoroughly disinfected. Nothing used in the room furing the sickness should be removed until this has been done.

"11. The attendant and any one who has assisted in caring for the sick person should also take a bath, wash the hair, and put on clean clothes, before mingling with the family or other people, after the recovery of the patient. The clothes worn in the sick-room should be left there, to be disinfected with the room and its contents by the Health Department.

"METHORS OF DISINFECTION.

"t. Hands and Person.—Standard Solution No. a should be diluted with an equal amount of water. Hands soiled in caring for persons suffering from contagious diseases, or soiled portions of the patient's person, should be immediately and thoroughly washed in this solution, and then washed with soap and water. The nails should be kept perfectly clean and the hands should always be carefully disinlected before eating.

"2. Soiled Clothing, Toxicls, Naphine, Bedding, etc., should be immediately immersed in Standard Solution No. 1, and soaked for twelve hours, being occasionally moved about in the flind so as to being the disinfectant in contact with all parts. They should then be wrung out and holled in scopends for one hour. Articles, such as beds, etc., that cannot be washed should be burned.

*3. Food and Drink.—Food thoroughly cooked and drinks that have been builed are free from disease germs. In presence of an epidemic of cholera or typhoid fever, milk and the water used for drinking, cooking, washing dishes, etc., should be boiled just before using, and all persons should avoid eating fruit, fresh vegetables, and ice. Ice may, however, he used when ordered for the sick by a physician.

"4. Discharges of all kinds from patients suffering from contagious diseases should be received into earther vessels containing Standard Solution No. 1 or 3. Special care should be observed to disinfect at once the vornited matter and the intestinal discharges from cholera patients, as these alone contain the dangerous germs. The volume of the disinfecting solution used should be at least four times as great as that of the discharge. After standing for at least one hour in the disinfecting solution, these discharges may be thrown into the water-closet. Bedding or clothing solled by the discharges must be at once placed in Solution No. 1, and the bands of the attendants disinfected, as described above.

- "5. Closets, Sinks, cic,—Each time the closet is used for infected material, at least one quart of Solution No. 7 should be poured into the emptied pan and allowed to remain there. All discharges should be disinfected before being thrown into the closet. Sinks should be flushed at least once daily with the same solution.
- "6. Dishes, Spoors, etc., used by the patient should be kept for his exclusive use, should not be removed from the room, but should be washed there, first in Solution No. 1, and then boiled in strong scapends. These washing-fluids should afterwards be thrown into the water-closet. The remains of meals should be thrown into a ressel containing milk of lime. The contents of the vessel, after standing half an hour or more, should be thrown into the watercloset.
- "7. Soiled Illord-work, Plantz. Plain Furniture, etc., should be thoroughly washed with Solution No. 2. Uphol-tered furniture, exetains, or carpets which have been soiled by the discharges should be referred to the Health Department for disinfection or destruction.

"It is important to remember that an abundance of fresh air, smlight, and absolute cleanliness not only help protect the attendant from infection, but also aid in the recovery of the sick.

"Norm.—The cost of the carbolic solution is much greater than that of the other solutions, but generally is to be much preferred. When the cost is an important element, the techloride solution may be substituted for all purposes for which the carbolic is recommended, excepting for the disinfection of discharges, eating utensils, or articles made of metal, and of clothing, bedding, etc., which is very much soiled. Its poisonous character, except for external use, must be kept constantly in mind.

"DISERFECTION AND DISERFECTANTS.

"The contagious diseases are caused by minute bring germs. The object of disinfection is to destroy these. In order that as few articles as possible shall be exposed to infection by the disease germs. at the very beginning of the illness all unnecessary furniture (espeeially upholstered furniture and curtains), and other unnecessary articles, should be removed from the sick-room.

"The following are the best-known disinfertants:

" t. Heat.—Continued high temperatures destroy all forms of life. Boiling for at least one-half hour will destroy all disease germs.

"2. Carbolic Acid.—Standard Solution No. 1 is composed of six ounces of carbolic acid, dissolved in one gallon of hot water. This makes approximately a five-per-cent, solution of carbolic acid. The commercial colored impure earbolic acid will not answer for this purpose. Great care must be taken that the pure acid does not come in contact with the skin. When practicable, the carbolic solution should be used as but as possible.

"3. Corrosice Sublimete (bichloride of mercury).—Standard Solution No. 2 is composed of stary grains pulserized corrosive sublimate and sixty grains of chloride of ammonia, dissolved in one gallon of water. This solution must be kept in glass, earthen, or wooden ressels (not in metal vessels).

"The above solutions are very poisonous when taken by mouth, but are harmless when used externally.

** A Mills of Liner.—Standard Solution No. 3 is made by mixing one quart of dry freshly slaked line with five quarts of water. Line is slaked by pouring a small quantity of water on a limit of quick-lime. The line becomes hot, crumbles, and as the slaking is completed a white dry powder results. The powder is used to make Solution No. 3. Air-slaked lime has no value as a disinfectant.

"The proprietary disinfectants, often widely advertised, and whose composition is kept secret, are relatively expensive and often increliable and inefficient. It is important to remember that substances which destroy had odors are not necessarily disinfectants."

The medicinal treatment of mild cases may be expectant. Cooling drinks—ten or turder dreps of dilute hydrochloric acid in a gobles of water—will often suffice. The food must be liquid, or at most semi-solid; in the first week milk and farinacea. Constipation during the first period is relieved by a dose of calomel or a vegetable aperient. Diarrhera, particularly in the later stages, requires hismath, opinio, perhaps astringents, such as lead, and at all events antifermentatives, such as resorcio, sulol, or naphtalin; the mild form of tromatitis and pharyngitis, half a grain or a grain of potassium chlorate in a teaspoonful of water every hour or two hours. Larger children should be taught how to gargle at regular intervals; but the posterior wall of the fances is reached better by frequent drinking

of ever so small quantities of water, or of water with a few drops of diluxe hydrochloric acid, and by nasal irrigations. There should be no wanting for glandular swelling before the nose and the pharynx are attended to. The earbolic acid injections of Heubner and those of chlorine-water of Dr. A. Seibert into the tissue of the torsils have not received the approval of the profession to any great extent. The threat complications of scarlatina should be attended to in time. eather when caused or attended by streptococci or Klebs-Löffler bacilli. The frequency of the latter varies according to localities, seasons, and epidemics. Some observers claim them in fifteen per cent. of all cases of scarlation. Ranke found pseudo-membranes in sixtyfive per cent, of a season's cases at the Munich Children's Hospital. In \$5.7 per cent, of mild or severe (laryngest) cases he met with the diphtheria bacillas, in 48.8 with streptococci. The former were also observed in most of those cases in which the pseudo-membranous complication arose in the later stages of the disease. That is who he recommends the use of the dightheria antitoxis in doubtful cases also. This and the important subject of general and local treatment of pseudo-membranous affections will be discussed in the article on diphtherm. In most cases (there are exceptions to that rule) when they are first observed on the fourth or fifth day of scarfatina they are seldom alarming; when on the first day, or previous to the scarlatinous eruption, they are quite ominous. In such instances they are often accompanied by rapid glandular swelling and serious symptoms of sepsis. Applications of ice to the swotlen neck will often keep the tumefaction within certain limits. When gaugeenous degeneration of the glands cannot be prevented, and local suppuration occurs in the centre, deep incisions and the local use of carbolic acid are required in the same manner in which the same affection is dealt with in diphtheric diseases generally. In milder cases, two applications daily of one part of indoform in eight or twelve of flexible collection lave a good effect. Even they are mostly not wanted; cool appliextions will suffice. Occasional retropharyngeal abscesses require incisions.

High temperatures do not demand very active treatment unless they result in functional or organic changes of the heart or brain. So long as these two organs perform their duties normally the temperatures may be let alone. A very frequent and feeble pulse with a high temperature indicates, besides a cardiac tonic, quinine, rubbing with cool water or water and alcohol cold applications to the heart, or a warm bath. A cold bath is not horne well: in urgent cases a cold pack may do good. A feeble and archythmic pulse requires the very strongest stimulants. Phenacetin and antipyrin are not us be recommended in these conditions. Delirous and somnolence, also convulsions, may be the results of high temperatures, and, particularly when the whole body, feet included, is hot, require the same treatment. Antipyrin, however, I have never seen to reduce the temperature in congestive or inflammatory conditions of the brain. The latter may be the direct result of the infection, but also, at a somewhat later, period, of rheumatism. In either case the treatment does not materially differ from what it would be under ordinary circumstances. The latter form requires salicylates, the application of ice to the head, counter-irritants to the feet (sinapisms) and intestines (calonel), and in rare cases leeches to the septum narium or to the mastool processes. The vital indication proceeding from the condition of the brain is here of the greatest importance.

When the same symptoms set in with or without a high rectal temperature and cold extremities, a mottled skin, and a cyanotic hue, the large amount of the toxin which has invaded the system demands strong stimulants,—ammenia, misk, and campbor. They are better than alcohol. To their internal administration may be added campbor dissolved in sweet almond oil, and sporteine sulphate in mater, subcritaneously, in free and frequent doors. These toxic symptoms while the temperature is low bear opiates (morphine, one-fiftieth or one-twentieth of a grain, one to three milligrammes), in repeated doses, one well. Universal heat requires tepid bathing, with cold affusions over, or applications to, the head; a cool surface, with cold extremities and frequent and filizom pulse, hot builting and powerful friction, and hot enemata, with stimulants.

Voniting before and with the eruption is a frequent symptom. When moderate, it may be let alone; no food must be given for a number of hours, ice-water in teaspoon doses, or an ice pill, every five or fifteen minutes. When quite severe and exhausting, small doses of an opiate, once every hour or two, will be found useful. In a few obstinate cases occaine muriate, in doses of one-twentieth or one-fifteenth of a grain, answered well; in others, arsenous acid, every two hours, a two- or three-hundredth part of a grain (one-third or one-fifth of a milligrammte).

One of the early complications is "rheumatism." It makes its appearance often on the third or fifth day. In some cases it is muscular, and then mostly confined to the lower extremities; in otherstricular, but with less swelling than we are inclined to expect. Indeed, articular rheumatism in children exhibits the usual symptoms to a less characteristic degree than in adults, but they are so pro-

nomiced as not to be mistaken. This rhetmatism ought to be treated at once, for endocarditis complicates it in infancy and childhood very much more readily than in advanced age. Most of the cases of scarbeinal endocarditis carried into later life are due to rheumatism. The joints ought to be well covered with soft cotton, and sodium salicylate given every two or three hours, in doses of from four to ten grains (three to ten decigrammes).

Endocarditis and persearditis, without rhemistism, are rare. Ulcorons endocarditis I have not seen except with serious general sepsis, caries of hones, thrombosis of sinus, and other symptoms of a general pytemia.

Supportative inflammations of joints are very tare. They are the cause, or part, of generalized pyzonia. This can sometimes be prevented by early surgical treatment. There is an affection of the epiphyses, however, which is very common and differs from the above. It consides in extensive hyperternia, and possibly inflammation. Clinical observation yields quite a number of cases of infectious diseases. but mainly scarlating, in which during convalescence, and long afterwards, the regions of the joints are swollen and painful. This epiphysitis is the cause of the rapid increase in the growth of children who have passed through scarlarina, but may also be the cause of serious changes, from simple " growing pains" to suppurative separations of the epiphysis from the diaphysis. In every such case, during convalescence and afterwards, the joint ought to be well supported by soft splints and emplastr, hydrarg,, or sidodonii collodion, absoline sest enjoined, and phosphorus given in three daily doses of a two-limiteelth of a grain (one-third of a milligramme), or more. several times daily.

Complications with preemonia and plearitis are quite frequent, the latter is upt to be purulent; if so, its existence explains in non-cases the continuance of the high temperature. In every case, purulent or not, the indications are not those of an expectant plan of treatment. Both general and cardiac stimulants and tonics are required, and pyothorax requires an operation always.

Hemorrhages are not frequent, but ominous when they occur. Some appear, like the symptoms of generalized purpura, more towards the end of the malady; some in the muscles in the third week or later, with the result of starting a more or less universal myositis; others in the mucous membranes. Many are the result of embolic processes, and complicated with local gangrens. Spontaneous thrembous, however, of the extremittes or the cheeks ("noma") are not so frequent in scarlatina as in measles.

The presence of pemplingus during the eruption appears to indicate a hight degree of smomotor paralysis. It is an ominous complication and requires stimulants as above. Urticaria is more troublesome than dangerous. The immetion with pork, vaseline, glycerin, or tanolin—soothing and pleusing in most cases of scarlatina—may enface to relieve it. Now and then mild alkaline lotions (sodium bicarbonate in water, 1 to 100), or washing with carbonated alkaline waters (from the siphon) or with a proper dilution of earbolic acid (1 to 200), will prove beneficial. When the burning and itching are quite amonying, naplitol five parts and raseline one hundred or one hundred and fifty may be tried to advantage.

The rules for the general treatment of searlatina must necessarily be very much like those applicable to all infectious diseases. Thus, in regard to them, and particularly to the debility and failure of the beart. I refer to my remarks on the treatment of patients suffering from typhoid fever. In scarlatina and eruptive fevers generally there is, however, an additional indication resulting from the particusation of the skin in the process. Indeed, more than in other disexics, the hygiene of the surface must be attended to. During the course of the disease, particularly during desquaration, a tepid bath, with soap, ought to be given from time to time, and the temperature of the room and bed kept uniform. While the former is to be cool, the body must be well covered and kept warm. This is the more necessary, as nephritis may set in at any time during many weeks This serious complication, it is true, may occur though the patient be kept in bed, in consequence of voluminous elimination of renal epithelia, and also, perhaps, of bacteric invasion; but exposure and sudden changes of temperature will always hold their places in etiology in the minds of those who do not forget to notice the living clinical case besides the microscopical excrement.

In this connection, while I reserve the subject of nephritis for some future occasion, I will only urge the advisability of beginning the treatment of scarlatinal nephritis with a moderate close, from one-half to one grain (0.03 to 0.06), of calomel, repeated from time to time through the first two or three days. Its purgative effect, if too-great, may be stopped by a small dose of opium given after every loose movement.

There are a great many other complications, such as utilis media, purpura, noma, onychia, keratomalucia, etc. Each of them will be disceased in their proper places. Mere combinations with other discases, such as altooping-cough, measles, varioella, vaccinia, variola, and typhoid fever, do not add to, or alter, the indications for treatment.

At all events, the belief in scarlet fever specifics should be discarded in the present state of our knowledge. Neither magnesium nor sodium sniphite, nor sodium benzoate, nor belladonna has fulfilled the promises of its sponsors. What some special antitoxin will do remains to be seen. Marmorek's antistreptococcus serum is still in its experimental stage, though the number of favorable reports is increasing. If anywhere, an antitoxin is the only possible remedy which can hold out any hope in those cases which perish in a day, sometimes in the first few hours of the illness, under the influence of an overwhelming intoxication, and are not relieved by hot bothing. or purging, or stimulation. My own experience with Marmorek's antistreptococcus serum in very lad septic cases of scarlating is fairly good. A few desperate-looking cases recovered under its use. Repeated communications from the discoverer arrive at the same condusion,-viz., that the streptoroccus found in man is the same, no matter where found and in what indections. "Varieties" are but apparent. The scarlatina streptococcus is no exception, and yields the same toxin as that formed by the others (it belongs to the group of those diastases which are destroyed by a temperature of 70° C.L.

Crede's preparations of soluble silver should be remembered in connection with scarlating. In 1807 be recommended the soluble silver, first described by M. Carey Lea in 1889, for many sorts of infectious diseases. From being extensively used in poerperal sepsis, it extended its indications to erysinelas, scarlet lever, severe typhoid, pytemia, etc. As usual, enthusiasm greeted its introduction and indifference scoffed at it. I before it is of some use, and that it has benefited a good many cases linder my observation. A fifteen-per-cent, oildment (" Crede cintment") is rubbed in once or twice daily, half an hour each time, best on those parts on which the integument is thin and the lymphatics superficial and numerous (inner aspect of thighs and forearms). The dose for an adult is one drachm (40), for a child from fifteen to twenty grains (1:0 to 1.25). It should be rubbed in until there remains but little discoloration from it, usually half an hour: to accomplish that, the skin should be moistened with a few drops of mater. As the preparation ("colloidal silver"), is soluble in twenty parts of (sterile) water, a few culic continetres of a one-per-orm, solution may be used subcutaneously. A solution of one part in from two to five hundred parts has been injected into a vein, and pills containing one-sixth of a grain (0.01) and one and one-half grains (0.1) of sugar of mile have been given internally; two to an adult, three times a slav. My experience is limited to the "Credé ointment."

12. Meades,

The virus of measles appears to be more volatile (communication even intra-uterine) than that of any of the other contagious discases with the exception of influenza. Its communicability appears to be greatest during the prodromal stage, and the invasion takes place, in all probability, through the bronchial mucous membrane. The incubation may last from eight to fourteen days, the first four or five of which may be attended by some fever. During all this time, and during its whole course, the disease is contagious.

Very few cases are seen during the first six months of life. After that it is common, and repeated invasions are frequent. In many seasons the mortality is very trifling; in some epidemics it has reached thirty-three per cent, of all the cases. The first epidemic occurring in regions where measles had not been known previously was found to be very dangerous, and those which occur after long interruptions are likely to prove very severe. Thus, the question whether the well should be separated from the sick will depend a great deal on the severity of the epidemic.

The temperature of the room should be comfortable, about po" F., a little warmer than in scarlatina, and the air moist. The light ought to be excluded to a certain extent, but not to absolute darkness. For a number of days the child should be kept in bed, unless very restless; in that case it may be taken out, well covered. It is a good rule to keep the patient in bed a week after the disappearance of the fever, and in the house ten days or a fortright more. Relapses are not uncommon, and those particularly who have an hereditary tendency to tuberculosis ought to be protected from exposure. Especial care must be taken during the cool or rainy season.

Mild cases require mostly a hygienic treatment only; still, every case has its own indications. When there are otitis, bronchitis, pneumonia, or dysentery, it is self-inderstood that the patient must be kept in hed during the continuance of the complication. Warm and dry weather and a sandy soil will permit a patient to leave the house somer than would be permitted under other circumstances.

Constitution may demand gentle treatment in the beginning. As a rule, an enema will suffice. Castor oil or the clisir of rhammus purshiana (Nat. Form.) may sometimes be required. No firastic should be used because of the tendency to diarrhera or dysentery prevailing in many instances. For the same reason no glyceria should be injected into the rectum.

A convention in the beginning of the disease does not always

mean great harm. It takes the place of the chill in the whilt, but is more dangerous because of the possibility of cerebral hemorrhages while a lasts. Therefore it ought to be cut short as soon as possible. Chloroform inhalations will relieve the spasm, chloral hydrate internally, or in an enema, the persistent irritability. Warm bathing may be resorted to when, under these circumstances, the cruption is allow in showing itself. The head must be kept cool, the feet should be warmed.

Epistaxis may be let alone while mild. Sometimes it relieves the congested innours membrane of the nares. When severe it must be stopped.

The organs of circulation do not often suffer in measles. Pencarditis and endocarditis are mut with very rarely, but Baginsky reported a case of purulent pericarditis and myocarditis. In epidemics of mineral severity heart-failure is of frequent occurrence. It is to be treated according to the principles laid down in the articles on starlating and typhoid fever. A peculiar feature in very severe neadesis the frequency of thromboses (microbic?). Indeed, in no other infections disease are they met with so often as in measles. The through occur in the valva, in the skin and subcutaneous tissue, about the face as cancrum oris (noma), and on the distal parts of the extremities, particularly the legs. Disseminated purpura is not frequent. but gangrene of the skin is not at all uncommon. The odor of such gangrene, and of eancrum oris, is exceedingly offensive, and requires strong aminfectants and dendorizers. Thymol in solution of 1 to 1000, iodoform in powder or in vascline ointment, or a mild solation (one to two per cent.) of formalm will be found serviceable. The subject of some will be discussed later.

What has been called hemorrhagic measles is not always very malignant. In a great many cases it means nothing but the effusion of some hematin into the emption. The complication of the emption with a simple crythema or with a mild pemphigus is mostly an inslifferent matter; with extensive pemphigus it may be dangerous, and require early stimulation.

The respiratory organs suffer mostly in measles. There is always catarrh of the nose, which way lead at an early period to timefaction of the lymph-bodies around the neck. If such be the case the catarrhi should not be let alone, but treated with gentle injections of a mild solution of salt water or beracie acid. The conjunctivitis connected with it requires tepid or cool application or instillation several times a day of a few drops of a two-per-cent, cocaine solution. It should have close attention, for it is sometimes followed by destructive pro-

cesses of the cornea. A moderate amount of brenchial catarrh may be let alone, provided the cough is not very severe; for severe attacks of coughing, even without much congestion or inflammation, may produce bronchicciasis or emphysema. Particularly is this the case when there is complication with pertussis. Here morphise may be given in sufficient doses. Bronchitis is rarely dangerous unless it be capillary. Broucho-pneumonia is always a serious complication and a very frequent one. In a number of cases its course is very rapid. accompanied by evanosis and a very small pulse. Active treatment is required in these cases. The inhalation of oxygen will now and then bridge over argent conditions. Warm bathing and cold affusion in a warm bath will be of service, for it is necessary that the patients, particularly small children, should cry. Unless they cry they will suffocate. Stimulant expectorants are in order, such as camphor, benzoic acid, or ammonium carbonate. Ammonium muriate is not sufficient. Cardine stimulants are required at the same time, such as digitalis, sparteine, camphor, and musk: No depressing expectorants should be given. Antimonials should be avoided, at any tabe.

There is always some catarrh of the larywx and sometimes a pseudo-membranous laryngitis holding, or caused by, either coeci or Klebs-Löttler bacilli. In the latter case the treatment is that of diphtheritie deposits. (See article on Diphtheria.) When the croupous symptoms are very orgent the air of the room ought to be filled with steam, and the patient encouraged to drink as much as possible, particularly alkaline uraters. The internal administration of potassium iodide in moderate doses will do good service occasionally. So will an opinte, particularly at bestime. In connection with the catarrhal affection of the nose, office is seen now and then. According to Schwartze, three per cent, of all the cases of office can be traced to measles.

During all this time the kidneys ought to be watched. It is true that nephritis is by no means a frequent occurrence in measles, but it has been found often enough to justify the greatest attention.

Cerebral complications have no special indications. Rules for their treatment will form the subject of a future discussion. Meningitis, as one of the localizations of tuberculosis which often followsmeasles, is not infrequent.

ta Rathelu (Rubylla).

It has not yet conquered an undisputed place in nesology. There are still many who do not consider it a separate disease. The

eruption looks mostly like measles, sometimes like crythema, or articaria, or scarlating. According to some: it begins, after an incubation of from nine to eighteen days, on the face; others dony this, and speak of a suffused blush only. It lasts one or two days, becomes rather yellowish, and is followed by a very mild desquamation. Many casehave been described which were connected with catarrh of the respiratory organs, of the conjunctiva, and of the throat (by no means always present; sometimes only a day before the eruption takes place), with glandular swellings (submaxillary, mastoid, axillary, inguinal) and very moderate fever. These are the cases which have been described under the name of rubella morbillosa, and would be diagnosticated by many, myself included, not as rotheln, or rubella. but as a mild form of measles. The redness of the fances is not always intense; a punctated examberna of the palate is frequently found; diazo-reaction is rare. If there he any such special disease, no particular treatment is required, except that of complications (catarrit, coryza, conjunctivitis, broughitis, meningitis, arthritis, albuminuria), most of which are rare.

14. Manga.

Its incubation lasts a fortnight, and sometimes three weeks. Thusprevention by isolation can seldom be accomplished. The infection must be presumed to take place through the Stenonian duct; that is why a careful hygiene of the month should be considered the best preventive. Often the patients do not feel very sick. Many do not take to their heds. In many cases covering the swelling with cotton is sufficient to protect it. When there is a great deal of pain narcotic applications may be made or ice applied. The latter certainly reduces the amount of swelling, although it may not shorten the course of the disease. I have often found the application of iodoform collodion (one to eight or ten), made twice a day over the whole surface, quite successful. When there is a tendency to suppuration, warm applications will favor it. Unless perforation take place into the mouth or the external ear, a large incision must be made in time and treated antiseptically. The diet must be that of all fevers,-fluid. A consecutive anamia which is more frequent than the apparent mildness of the affection would seem to explain requires generous feeding, iron, nov., and a change of climate. Conplications with otitis, ocplinitis, or orchitis have their own indications.

15. Variola. Variolvis.

Vaccination ought to take place early, for genuine variola in the first year is quite frequent among those not vaccinated. There are also many cases of variola between the eleventh and twelfth years among those not vaccinated. The small-pox reports of the German empire emplusize the fact that no case of variola (variolois) occurring a vaccinated children who had more than two cicatrices terminated fatally; nor was there a fatal case among those who were revaccinated. There was no fatal case, where the vaccination marks were very distinct, between the thirteenth and forty-fourth years. The fact that none died that exhibited more than two scars appears to prove that the single mark ensumary among us is not sufficient. At all events, many children vaccinated in the first year of life will undergo a successful resuccination when they are only from four to six years old. At that time revaccination ought to be tried, and, if unsuccessful, should be repeated from year to year.

Disinfection of bodding, clothing, furniture, and dwelling, and isolation, are now recognized as absolute necessities in variola more than in any other disease. Thus little difficulty is caused by ill will or ignorance. Patients with various ought to be kept cool and washed frequently with cold or tepid water; now and then an ether spray or an ice-bag over sore parts will be found quite agreeable. Fever is sometimes very high, and ought then to be modified by antipyreties. The delirium is sometimes so violent, bordering on mania, that the inhalation of chloroform or the administration of chloral hydrate is required. The influence of universal compulsory vaccination cannot be shown better than by the report of Baginsky, who has not met, in children, a single case of genuine variola and but few of variolois. The eyes ought to be covered with cold compresses, sore evelids covered with vaseline or zinc comment. Superficial scress on the skin, and those which yield an offensive odor, should be treated with thymol, salicylic acid, or iodoform. Scalo must be removed from the nostrils so as to facilitate respiration; abscesses should be opened in time and disinfected, and complications treated Septic symptoms require strong stimulants, general and cardiac, Two of the most severe complications are cedema of the faryax and larvneitis, which may require, on short notice, tracheotomy or intubation.

After the disappearance of the feverish stage the patient ought to be bathed once every day or every other day, and immetions of fat made all over the surface until desquamation is complete.

10. Varicella (Chicken-Pax).

When varicella vesicles are in the mouth, they require washes with potassium chlorate (1 to 30 or 50); when on the vniva, derivatel pourder, or derivatel with cold cream (1 to 6 or 8). Constitution and gastric symptoms should be relieved. As the disease is very contagions, and not always mild, the child ought to be isolated, and on no account sont to school. Dissemination in schools and in dispensaries is an every-day experience.

Bad cases must be kept in bed. Very few require medicinal treatment, except when there is local or disseminated gangrene, which I and many others have seen. In such cases local antiseptic applications are required: aluminum acetate (1 to 100), potassium permanganate (1 to 250 or 1000), formalin (1 to 50 or 100), or an ointment of resorein (1 to 20 or 40), salicylic acid (1 to 40), or isoloform (1 to 6), or as a powder. Besides, alcoholic and other internal stimulants are demanded. A small number of instances of consecutive nephritis are now on record, as also in vaccinia; thus the urine ought to be examined in every case for several weeks.

17. Parchila

Irregularities in the development of vaccinia cannot always be prevented. As a rule, the inflamed areola and lever which indicate the beginning of immunity appear on the eighth or ninth, sometimes on the eleventh day. In the newly-horn they are not well pronounced. and the success of the vaccination becomes doubtful. Still, it should be obligatory during an epidemic. The appearance of the vaccination vesicles (and pustnles) will be delayed sometimes without an apparest cause. Accidentally (transmission by scratching) they may come on distant parts. A universal eruption (from no such cause) has been reported by Colcott Fox (Laucet, 1892, vol.), p. 362), by Baginsky ("Lefith d. Kind.," 5th ed., p. 178), and by others. Very high temperatures with nervous symptoms may require, in rare instances, an antipyretic treatment; they accompany mostly a high degree of local inflammation, which will be soothed by the application of cool water or of diluted aqua plumbi. Ulcerations result mostly from uncleanliness and from scratching. They may be prevented by great care and cleanliness in vaccination, which requires the same asepsis as any other operation. No plaster should be applied before the wound is perfectly dry. Moreover, they appear to be more frequent when Immanized rather than animal temph is used. Todoform or dermatol, in powder or as oistments, is indicated. The latter should

always be preferred. When the former is employed, however, no lymph should be taken from a vesicle that has been opened hours before. Nor slors it appear to be safe to use vaccine which has passed through more than three individuals. Axillary lymphadenitis disappears, with very rare exceptions, with the local inflammation. Rhachitis, scrofinla, and tuberculosis, when they are observed after vaccination, are accidental. Syphilis has been transmitted when the serum taken from the arm contained blood of a syphilitic infant; that is another reason why animal lymph should uniformly be preferred. Erysipelas does not always originate from the margin of the local inflammation, but sometimes at some distance. Neither in regard to * prevention nor to treatment can anything be said in addition to the remarks on erysipelas in general (p. 222). Diphtheria has arisen from vaccination wounds, when we knew less about its communicability and its presentability, and were more carefess than we are (or ought to be) at present. The local treatment of such accidents (or sins) will be discussed under Diphtheria. Septicemia may occur, nephritis also. At the very height of the reactive inflammation. or during the week succeeding it, inticaria may appear, or small or large vesicular eruptions, which are liable to disappear with the desiccation and falling off of the scabs. They should be considered as nervous outleeaks only, and not in the same light as an ecouna -local or universal-which dates from the time of vaccination. The latter should not be taken for its real, but for its proximate cause (the fever) and opportunity. A case of universal psociasis which originated in a fresh vaccination sear has been reported by Bethman.

18. Ergeipelae.

It is not probable that the healthy surface can be attacked by it. As in most cases of diphtheria, so in all cases of erysipelas, a sore surface forms the resting-place of the microbe (streptococcus). Erysipelas may make its appearance on an eczematous skin. On the lead it sometimes escapes notice for some days. Excertations of the anus and sexual organs, or slight injuries flone by a pin or by the fingernal, are sufficient to cause it. It often originates in the intertrigo of the infant or in the neighborhood of a succenation mark. In the latter case it seldom appears immediately after vaccination, very often not before the second week or later. Chronic usual catarrh is a frequent cause. Some children will have erysipelas extending over both cheeks one or more times every year. Small or large operation rounds are a frequent source; so is diphtheria, with which erysipelas

is occasionally complicated, and many cases are seen to take their start from a trachectomy wound. In the newly-born it appears as a rule, on or near the nevel, and is generally connected with universal sepsis. Prevention of the disease will mainly depend on the removal or relief of the several causes which have been sunmerated.

Every case of crysipelas should be isolated, and diet and general treatment be regulated on general principles. The local treatment may be quite simple in some cases. The erysipelatous surface may simply be covered with soft cotton, or a powder of talenm, or of amolum, or one part of salicylic acid with perhaps ten parts of zinc oxide and twenty-five of amylum. Applications of lead wish and opium or of zinc sulphate have been in general use for a long time; also of solutions of sulphate of iron; now and then the application or intraction of blue ointment. The latter I cannot advise because of the pain and irritation resulting. The inflamed surface has been covered with collection. Infants and children will not bear it. Ferreire has used, in a case of mysipelas on the leg of a child of two years and a half, a mixture of one part of resorcin in seven thousand five hundred of transmaticin (0.008 to 60.0). Cold applications have been made, ice has been applied, and, where the extent of the erysipelas is limited, to great advantage. Neither the saturated solution of silver mitrate nor the solid caustic has been of azīvantage.

Hueser recommended many years ago the subcutaneous injection. of a two-per-cent, solution of carbolic acid round the inflamed surface. and claimed to have confined every case within its original limits. In place of that. I advised the application, not on, but around the erysipelatons area, of a mixture of one part of carbolic acid in eight. ten, or fifteen parts of eleic acid. I have treated many cases in that way, and most of them quite successfully. The mixture was rubbed into the surface around the diseased part at frequent intervals, or, when the erosipelas was confined to the extremity, a band or compress soulced in the mixture was applied just outside the micased part, not infrequently with the result of stopping the process. Instead of the earbolic acid as administered by Hueter, Ducrey uses a solution of one part of corrosive sublimate in one thousand of water, and repeats the injections, which are to be made three centimetres apart, after twelve hours. A better plan, however, is, after all, to apply carbolic acid, one part dissolved in ten or fifteen of alcohol, directly to and beyond the surface, every hour or every few hours. It is readily absorbed, and may do good, but also harm by affecting the

kidneys. Thus in every case where it is to be applied the kidneys should be watched carefully, and particularly in young children.

Washing with and applications of a solution of hydrargyrum bichloride in water (1 to 2000) have been highly recommended; also an ointment of resorcin live parts and vaseline and adops langhydrosus (lanolin) ää ten parts. I have seen a few cases doing well with it, but I have been better pleased with a succente of equal parts of ichythrol (ammonium sulpho-ichthyolate) and vaseline. In place of this a solution of ichthwol (2 to 10) in equal parts of other and glycerin (to to 30) has been employed. The compound tineture of benzoin may be painted all over and beyond the diseased surface mer every hour or two hours. Absolute alcohol (ninety-nine per cent.), applied frequently, has rendered me excellent service in limiting the area of infection. That is what is aimed at and accomplished by the hedging in of the morbid process, an operative procedure invented by Kraske and Riedel, and introduced to us by Wille Merer. Railfience-like scarifications are made under an anaesthetic, down to the rete Malpighii, partly in the diseased and partly in the healthy surface, double so as to cross one another and allow no loophole. Then corrosive sublimate (1 to 500) is rubbed into and kept applied to the wounds, in most cases with almost instantaneous, at all events rapid, success. The modification of this procedure, which is practised in one of the large children's hospitals of Germany, by incising the diseased part and squeezing with the intention of removing the ordematons infiltration of the tissues, then scarifying deeply around and rubbing in ichthyol, and repeating that "treatment" until scurfs are formed, appears to get dangerously near brutality.

The internal administration of the tineture of chloride of iron has been considered a specific by many. That opinion is certainly based on an exaggeration of its ments. The preparation is, however, an antifermentative, and, while being a vascular stimulant, does not tause a rise of temperature in bad infectious diseases as it would do in the milder forms of fevers.

Abscesses complicating erysipelas require large incisions and antiseptic treatment. Erysipelas of the neck is very often complicated with orderna of the larynx, and may require scarification, tracheotomy, we intubation.

Meningitis, which frequently accompanies erysipelas of the scalpce of the miso-pharynx, has its own indications. It should not be forgotten, however, that many cerebral symptoms simulating meningitis, and mostly attended by high temperatures, are merely those of the toxin infection, and an antiseptic treatment may do good. The recovery of a young man observed with such symptoms fately I attribute solely to the large quantities of brandy administered. In such cases an efficient streptococcus antitoxin that Manuorek is trying to furnish would be of incalculable benefit, and Credé's ointment and his other preparations of soluble silver are certainly worth trying. The diet should be more stimulant (broths, alcohol in great dilutions) than in (the beginning of) most infectious diseases.

19. Diphtheria.

The morphological structure of almost all the pseudo-membranes in the throat, nares, larvnx, and other places is identical. They have mostly been studied in the threat, where they are most frequently found. They consist of finely reticulated fibrin holding explate cells, lencocytes, and some erythrocytes. When they are superficial, it is the epithelial protoplasm which is thus transformed; when they are deep seated, with a tendency to necrosis, ulceration, and, finally (in cases of recovery), cicatrization, it is the fibrillar basic substance of the connective tissue, mostly of the mucous membrane, sometimes also of the submucous and deeper structures. This view, which underfine the discussions in my "Treatise on Dipittheria" (1880), has been again forcibly demonstrated by P. Baumgarten (Berl. blin, Work., Nos. 31 and 32, 1807). For years, however, it has been contournry to differentiate between those pseudo-membranes which are caused by, or accompanied by, the Klebs-Löffler bacillus and those which contain excel only. That these microbes do not establish any durant by their mere presence-that, on the contrary, they are met with to an indefinite degree in the mouths of the healthy-is well understood. Max Koher (Zeitschrift f. Hyg. u. Infect., vol. xxxi.) reports Klolu-Löffler bucilli in 18.8 per cent, of all people in contact with dighthersa patients. Personally he found them in eight per cont. People not in contact with such patients harbored Klebs-Löffler bacilli in from o.85 to seven per cent. To be considered pathological, or pathogenic, their presence in a pseudo-membrane in whatever stage of slevelopment is required. The Klehs-Löffler bacillus is found in its seperficial layers only, not throughout the whole thickness of the pseudomembrane, and not towards the macerating period; the oxems pervades its whole substance, and is even found in greater numbers in the deeper layers. To explain the absence of bacilli from these, it is assumed that they are destroyed by other microbes. Still, they are asserted-and that assumption has become an axiom, an article of faith-to evolve the toois which gives rise to all the symptoms and dangers of certain forms of constitutional dightheria.

Pseudo-membranes with Klebs-Loffler bucilli are called by pretty general agreement diphtheritic, those with cocci or with the "bacilli of pseudo-diphtheria" pseudo-diphtheritic. The "pseudo-diphtheritic bacillus" differs from the Klebs-Loffler very little, but is asserted by many to constitute an essential variety altogether. Such differences as these, when met with, for instance, in the case of tubercle bucilli, are not admitted to be different varieties, but only modifications of shape with modified virulence. In diphtheria the bacillus of "pseudo-diphtheria" is relegated to a second, inferior class, in spite of many objections. Lately, W. Spierig (Zeitschrift f. Hyg., vol. 8881.) demonstrated that in a diphtheria epidemic all transitions were found between pseudo- and Klebs-Loffler diphtheria. Besides, cases may be met with that are only "pseudo-diphtheria," and still are followed by diphtheritic paralysis.

Those cases which carry both bacilli and cocci are called mixed infectious. It has been asserted that the second class is of little virulence and attended by but little danger. This opinion leads to cruel mistakes in their management both by boards of health and such medical men as are influenced by them. For not only are many incomplicated cases very grave and fatal, but the mixed infections are the very worst forms met with in practice. Moreover, the streptococcus cases are contagious. Still, it is important to mention at once that the differentiation has its great practical weight. For it is only the first class, the bacillary diphtheria, and the third which are favorably influenced by antitoxin. The streptococcus variety does not share that advantage. What I have to say of treatment, however, refers-always with the exception of antitoxin-to all varieties. It remains for the attentive and experienced reader to apply it to the individual case, mild or serious, local or generalized, armse or chronic. Between these two latter varieties, however, accurate differentiation is impossible, because diphtheria has no limited course. There are cases that last a week or less; there are those that take many months. Not a few of the latter (see my "Treatise") require, besides the general treatment, a very careful local diagnosis and treatment, as they are in part caused or prolonged by local alcenation, torsillar or peritorsillar abscess, or concrement or other foreign body.

Local diphtheritis, constitutional diphtheric infection, and diphtheric sepsis are different degrees of the same disease. The first may run a fairly mild course, or be the initial stage of the second and third. The treatment, accordingly, may be sample or complicated, successful or in vain. It should be preventive, local, increase the

nower of resistance to the toxin prepared by the becilli and floating in the circulation and in the tissues, be directly antidotal, and be aimed against the results of the disease, such as swelling of the lymph-nodes, laryngo-stenous, nephritis, and paralysis. In many cases it may be necessary to fulfil only one or two of these indications; in others a combination of measures and remedial agents may be demanded. Explitheria is one of the diseases in which it is easy to do too little, but also to kill the patient in the larry of fighting the disease.

The treatment should be mainly preventive. In the light of the fact that the contagion of diphtheria need not be direct, but may be carried by persons who are not themselves affected, it will readily be sees how difficult it is to prevent se to escape it. Herbert Peck seported (London Lancet, December 14, 1895) the case of house B. which was probably infected by the father of the family, who himself did not suffer from the disease. His son slid not suffer, though there were germs in his throat, but he carried diphtheria to house C, whence it was taken to house D. This is only in instance of a large class. To what extent the bacilli and exert in the months of health; persons, where they are frequently found, may infect others it is yet impossible to tell. That may depend on circumstances concerning which we larve not yet much knowledge. We know, for instance, that saliva is to a certain extent a disinfectant, but also that it is least so for the diphtheria hacillus (and the pneumococens). It is also probable that a recent invasion is not so dangerous as older ones, which attain a higher degree of virulence when remaining some time in the crypts of the bonsils (E. Lexer, Arch. blin. Chir., 1897, vol. liv.).

As a preventive measure, every individual case of diphtheria destands isolation, during the winter on the upper floor of the house; the windows should be open as much as possible, furniture of any kind reduced to the least possible quantity, the room changed every few days and the bedding frequently.

To what extent the infecting substance may ding to surroundings is best shown by the cases of diphthena springing up in premises in which diphthenia had not occurred for a long time, but which had not been interfered with; and best, perhaps, by a series of observations of autoinfection. When a diphthenitic case has been in a room for some time, the room, bedding, curtains, and carpets are infected. The child is getting better, has a new attack, may again improve, and is again stricken down. Thus I have seen them die; but also improve

[&]quot;See the New York Health Department's recommendations and solve (p. 207).

immediately after baving been removed from that room or that house. If possible, a child with diphtheria ought to charge its room and bed every few days.

The sick in crowded houses and quarters ought to be transferred to a special hospital, which ought not to be too large. That is why there should be many of that kind, as I hoped there would be when I commenced the agitation for the new departure twenty years ago (President's address, Med. Soc. State of N. Y. Traux., 1882). Meanwhile the Willard Parker Hospital of New York, with its sixty beds, has been the only one of its kind for many years; and only one-half of the money requested by the present efficient Health Department of New York City for necessary additions to fever hospitals and disin-Secrant plants has been appropriated. The large amount of good the hospital is doing would grow in geometrical progression if there were, as there ought to be in a large and ambinious metropolis, half a dozen institutions of the same class, not only in behalf of the poor, but of the well-to-do also, both townspeople and strangers. I have advocated for dozens of years the erection of a hospital for the accommodation of infectious diseases breaking out among the thousands of strangers staying in New York City at all times. So long as there is no place to go to, the cases of scarlatina, diphtheria, etc., are hidden in, and are infecting, the boarding-houses and botels and the population at large. At present there is only one small private hospital of that kind in operation.

When dightheria breaks out in a house, either private or tenement, with no facility of isolation and no hospital in which to seek refuge. the well should be removed to a healthy place; in large cities, temporary homes ought to be provided for that purpose, to benefit the children of the poor. If the rich would but remember that their children will be affected through the many links between them and the poor (servants, messengers, schools, dresses brought home from the tailor or seamstress, or purchased in the stylish and expensive establishments which give out the work to tenement working-people and sweat-shops), their very egotism would compel them to do in their own interest what humanity does not appear to suggest to them. The sick should be reported to the health boards at once. The well children of a family with diphtheria must not go to school or church until a formight-the possible period of inculation, which some extend to twenty days-has elapsed since their last contact with the sick. Schools must even be closed now and then when an epidemic makes its appearance; teachers should know how to examine a throat. In this respect the regular inspection of schools by medical men, as

introduced in New York, will prove an infinite blessing to the commusity. The condition of the house is to be examined into and improved; attendants, servants, nurses and cooks, seamstresses and laundresses, teachers, shopkeepers, restaurant-keepers, barbers, hairdressers, with their mild diphtheritic attacks and strong pecuniary interests, are frequent sources of infection. In times of common danger, public pinces, theatres, ball-rooms, dining-halls, public vehicles, hackney-coaches, and railroad-cars should be examined by the authorities. There must be no clashing permitted between the public good and the inlividual money-lug. Clothing, hedding, even, and house should be thoroughly disinfected; articles used in the sickroom burned or soaked in a disinfecting fluid in the room, not carried over the house in a dry state; they are known to have started epidemics of diphtheria where the disease was unknown, thousands of miles away, after months or years, when carried in travellers' trunks. The rooms should be thoroughly disinfected after a case terminated favorably or unfavorably; the corpse disinfected, the funeral private, nothing removed from the house unless disinfected, no pieces of carpet thrown away to be picked up by beggars, no mattresses benevolently donated to the unsuspecting poor, and books from circulating libraries should be disinfected every time when coming from an infected house, and from time to time, on general principles, during the reign of an epidemic of diphtheria.

Prevention can accomplish a great deal for the individual. Dipletheria will, as a rule, not attack a healthy integument, be this cutis or mucous membrane. The best preventive is, therefore, to keep the mucous membrane in a healthy condition, as I have tried to practise and teach these more than forty years. Catarrit of the mouth, pharvnx, and nose should be treated in time. Many a chronic masal entarrh, with hig glands round the neck, requires sometimes but two or three daily salt-water irrigations () to 130, warm) of the nose, and, if the children be large enough to do so, gargling. Particular attention should be paid to the following facts. The water, if without salt, irritates; so does water cold or too marm. An average temperature of 90° F, will be found satisfactory. This treatment, however, must be continued for many months, and may require years. Still, there is no hardship in it and no excuse for its emission. A. Caille's many eloquent appeals have done much to popularize it. The rusal spray of a solution of silver nitrate (1 to 500 or 1000), when there are erosions, will accelerate the cure. Its application should be repeated every other day for some time. Not infrequently his a treatment which was considered obsolete when I was young been of

great service to me. It consists in the internal administration of the tincture of pinipinella saxifraga. It is certainly an efficient remedy in subscute and chronic pharyngitis and laryngitis. I generally give it to adults, diluted with equal parts of glycerin and water, a teaspoonful of the mixture every two or three hours, with the warning that no water must be taken soon after; children in proportion.

Large tonsils should be resected and adenoid growths removed while there is no diphtheria; for during an epidemic every wound in the mouth is liable to become dightheritic, and such operations ought to be postponed, if feasible. The scooping out of the tonsils, for whatever cause, I have given up since I became better acquainted with the use, under cocaine, of the galvano-cautery. From one to four applications to each side (also to the postuasal space) are usually sufficient for every case of enlarged tonsils or lacunar or deep-scated follocular amygdalitis ("tonsillitis"). It is advisable to canterize but one side at a time, to avoid inconvenience in swallowing afterwards, and to burn from the surface inward. Canterization of the centre of the tonsils may result in swelling, pain, and suppuration, miless the cautery is carried entirely to the surface; that is to say, the sourd must be on, or extend to, the surface, not remain inside the tissue. Another precaution is to apply the burner cold, press it on, and then heat. A strong book, bent in a convenient angle, introduced into a follicular fiscula, and torn through the superjacent tissue, will also cause cicatrization and a cure.

Nasal cutarrh and proliferation of the nucous and submucous tissues may require the same treatment, but, in my experience, the cases which demand it are less frequent than those in which the torsals need correction.

The presence of glandular swellings round the neck should not be tolerated. They and the oral and mucous membranes affect one another unitually. Most of them could be prevented if every eczents of the head and face, every stomatitis and rhinitis resulting from unclearliness, injury, or whatever cause, were relieved at once. Painstaking care of that kind would prevent many a case of diphtheria, glandular suppuration, deformity, or pulmonary consumption.

For its salutary effect on the mucous membrane of the mouth, potassium or sedium chlorate, which was long claimed by some to be a specific in diphtheria, or almost so, is counted by me among the preventive remedies. If it be anything more, it is an adjuvant only. It exhibits its best effects in the catarrhal and ulcerous condition of the oral cavity. In diphtheria it preserves the mucous memhrane in a healthy condition or restores is to health. Thus it prevents the diplithentic process from spreading.

This process is seldom observed on healthy, or apparently healthy, tissues. The pseudo-membrane is mostly surrounded by a sore, hyperamic, ordematous mincous membrane, to which it will then extend. Indeed, this hyperamia precedes the appearance of the diphtheritic excidation in almost every case. The exceptions to this rule are formed by those cases in which the tirus may take root in the interstices, pointed out by Stoche, between the normal tousillar epithelia. Very many cases of throat disease occurring fluring the prevalence of an epidemic of diphtheria are those of simple pharyugits, which develops into diphtheria under favorable circumstances only. These throat diseases are so very frequent during the reign of an epidemic, that in my first paper on diphtheria (Amer. Med. Timez, August 11 and 18, 1860) I based my reasoning on two himdred cases of gennine diphtheria and one hundred and eighty-five of pharyugitis without a visible membrane.

These cases of pharyngitis, and those of stomatitis and pharyngitis which accompany the membranes, are benefited by the local and general effect of potassium chlorate. When the surrounding parts are healthy or return to health, the pseudo-membrane remains circumscribed. The generally benign character of localized tonsillar diphtheria, which is upe to run its full course in from four to six days, has in this manner contributed to secure to potassium chlorate the undeserved reputation of being a remedy, the remedy, in diphtheria. The dose of the salt must not be larger than fifteen grains (one gramme) for an infant a year old, not over twenty or thirty (4.5 to 20) for a child from three to five years, in the twentyfour hours. An adult should not take more than one and a half drachms (six grammes) daily. These amounts must not be given in a few large doses, but in refracted doses and at short intervals. A solution of one part in sixty will allow a teaspoonful every hour or half a teaspoonful every half-hour in the case of a haby one or two years old.

It is not too late to raise a warning voice against the use of larger doses. Simple truths in practical medicine do more than somply bear repetition: they require it. For though the cases of actual potassium chlorate poisoning are no longer isolated, and ought to be generally known, fatal accidents are still occurring even in the practice of physicians. When I experimented on myself with halfounce doses, nearly half a century ago, the results were some gattriand intense renal irritation. The same were experienced by Fountain.

of Davenport, Iowa, whose death from an onnce (30.0) of the salt has been impressively described in Alfred Stille's "Materia Medica," from which I have quoted it in my "Treatise on Dipatheria." His death from potassium chlorate induced me to prohibit large dosesas early as 1860. In my contribution to Gerhardt's Handbuck dee Kinderkrunkheiten, vol. ii., 1877, I spoke of a series of cases known to me personally. In a paper read before the Medical Society of the State of New York in 1879 (Med. Record, March 15) I treated of the subject monographically, and alluded to the dangers attending the promisosous use of the drug, which had descended into the ranks of demestic remedies; and finally, in my "Treatise" (New York: 1880), I collected all my cases and the few then recorded by others. Since that time the recorded cases have become quite numerous. The facts are undoubted, though the explanations may differ. The probability is that death occurs from methamoglobinuria produced by the presence of the poison in the blood (Marchand, 1879), and consecutive nephritis, though Stockers has tried, by a long series of experiments, to fortify my original assumption that the fatal issue was due to primary acute nephritis.

There is in every individual case a certain danger which, though it be common enough in other exhausting diseases, is of particular moment in diphtheria. Where it is most frequent, even in apparently mild cases. It may be averted by meeting it early. It is beartfailure. When it has occurred, the indications for treatment become as clear as they are urgent but often futile. When it is simply feared, a preventive treatment will save many a case.

Heart-failure is usually developed gradually. It is foreshadowed by an increasing frequency and weakness of both heart-beats and pulse, by an occasional intermission, by unequal frequency of the heatsin a given period (say of ten seconds), or by the equalization of the interval between systole and diastole and diastole and systole. This latter condition, which is normal in the embryo and forms, is always an ominous symptom; so is the too close proximity of the second sound (so as to become almost inaudible) to the first.

Heart-failure is thie, besides the influences common to every discase and every fever, to tissue changes in the myocardiam, in the nerves, in the endocardism, and to the gradual formation of bloodcloss. These changes may be caused by the ill-nutrition of the tissues resulting from every septic condition of the blood, or to specific alterations due to the diplotheritic process. Failure may ensue either after having given warning or without any. Thus, every case of diphtheria onghe to make us anxious and afraid. Indeed, there is

no safety and no positive prognosis until the patient is quite recovered, and even advanced beyond the period at which paralysis may develop.

Whatever enfeebles must be avoided; absolute rest must be enjoined. The patients must be in bed, without excitement of any kind: take their medicines-which ought to be as palatable as possibleand their liquid food and evacuate their bowels in a recumbent or semi-recumbent position; crying and worrying must be prevented; the room kept airy and rather dark, so as to encourage sleep if the nations be restless; and restless they are, unless they be under the influence of sepsis, and thereby subject to fatal drowsiness and sopor-In no disease, except, perhaps, in pnenmonia, have I seen more fatal results from exertion on the part of the sick, or from anything more fatiguing than a sudden change of posture. Unless absolute rest be enforced, neither physician nor nurse has done his duty. The latter must avoid all the dangers attending the administration of medicines, injections, sprays, and washes. Preparations for the same most be made out of sight; every application should be made quickly and gently. On no account must a patient be taken out of hed for that purpose. I know of children dying between the knees of nurses who called themselves trained and had a diploma.

Pharmaceutical preparations, such as digitalis, strophambus, sparteine, caffeine, besides camphor, alcohol, and musk, should not be postponed until feebleness and collapse have set in. These are at least possible, even probable; and this is certain, that a cardiac stimulant will do no harm. It is advisable to use it at an early date, particularly in those cases in which, perhaps, antipyrin or phenacetin -the indications for which are certainly rare, as excessive temperatures are very exceptional-is given. Besides, it is not enough that the patients should merely escape death; they ought to get up, cite, buto, of Justimite, with little loss and speeds recuperation; a few grains of digitalis or their equivalent-preferably a good fluid extract -should be given, in a pleasant and digestible form, daily. When a speedy effect is required, one or two does of two or four minims each are not too large, and must be followed by smaller ones. When it is justly feared that the effect of digitalis is too slow, I give, with or without it, strophunthus, in doses of from one to six drops of the tincture, or sparteine sulphate. Of the latter an infant a year old will take one-tenth or one-fourth of a grain (six or fifteen milligrammes) four times a flay as a matter of precantion, and every hour or two hours in an emergency.

Of the same importance are alcoholic stimulants. The advice to

wait for positive symptoms of heart-failure and collapse before employing the life-saving stimulant is had. There are cases which get well without treatment, but we do not know beforehand which they will be. No alleged mild case is safe until it has recovered. When heart-failure has once set in—and it will often occur in apparently mild cases—our efforts are too often in vain. Thus alcoholic stimulants ought to be given early and often, and in large quantities, thoroughly diluted. There is no such thing as danger from them or intoxication in septic diseases. A few ounces daily may suffice; but I have often seen ten ounces (3000) daily of brandy or whiskey save children who had been doing bally with three or four (900 or 12000).*

Caffeine or, in its stead, coffee is an excellent cardiac tonic, except in those cases in which the brain is suffering from active congestion. For subcutaneous injections caffeine and sodium salicylate (or henzoute), which readily dissolves in two parts of water, is invaluable for emergencies, in occasional doses of from one to five grains-(six to thirty centigrammes) in from two to ten minims of water. From five to twenty grains (0.3 to 1.25) of camphor may be given daily, as campbor-water, or in a mucilaginous emulsion, which is easily taken. It does not disturb the stomach as ammonium carbonate is apt to do. For rapid effect it may be administered hypodermically in four or five parts of sweet almost oil, which is milder and more convenient than ether. Strychnine may be added regularly from the beginning of danger, and mainly in cases with little increase of temperature. Its effect is more than momentarily stimulating. A child of three years will take one-hundredth of a grain (one-half milligramme) three times a day, and more in an urgent case. and then subestaneously. But the very best internal stimulant in very urgent cases is musk. I prefer to give it from a bottle, in which it is simply shaken up with a thin muchage. In appropriate cases it ought to be given in sufficient doses and at short intervals. When ten or fifteen grains administered to a child one or two years old within three or four hours will not restore the heart's action to a more satisfactors standard, the prognosis is very lad. One of the latest

[&]quot;This has been quoted lately from a former edition of this book, as a sin or a crime, by Kassowitz. He neight have attoted my name in connection with his statement. If I have performed any crofinable acts in my life, my recommendation of large quantities of pure alcoholic beverages in diphtheria is among them. No "theoretical reasoning," no "experiments" occurring clinical experience repeated thomassis of times. Let Kassowitz or my other probabitionic find me a clinician of renews who would wish to do without alcohol.

stimulants, highly praised, is valided (containing thirty per cent. of membel). A few drops are to be given in acute collapse, with flying pulse, etc., and are credited with great successes.

The local treatment of the pseudo-membranes of the fauces is a subject of great importance. To still look upon them as an exerction which needs no interference is incorrect. If it were possible to remove or destroy them, it would be a great comfort; but they can be reached only in certain places, and just in those in which they do least harm. Pseudo-membranes on the tonsils, when circumscribed. are least dangerous. Almost all circumscribed forms of somillar diplitheria are among the most benign, at least so long as the process loes not extend. Most cases of the kind run their mild course in from five to seven days, and it is these which have given rise to the many proposals to tear, scratch, cauterine, swah, brush, and burn. There are cases which do not show the harm done. But neither the galvano-cartery, nor carbolic acid, nor tamin and glycerin, nor iron perchloride or subsulphate can be applied with leisure and accuracy to the membrane alone, except in the cases of very docile and very patient children. In almost every case the surrounding epithelium is scratched off or injured, and thus the diphtheritic deposit will suread. Besides, the pseudo-membrane of the tonsil is in part altered surface tissue (it always is wherever the epithelium is pavement), and not deposited upon the nucous membranes, from which it might easily be detached; it is embedded in the tissue. Whatever is done must be accomplished without violence of any kind. Nasal injections or irrigations can be made so as to wash the posterior pharyux and the tomals sufficiently, and thus render useless the special treatment directed exclusively to the throat. Besides, such treatment is easier, meets with less objection, and gives rise to less exhaustion than the foreible opening of the mouth. This fact w of great importance, as I shall show in connection with the local treatment of the nasal cavity. Where it is possible to make local applications without difficulty, the membrane may be brushed with tincture of iodine several times daily, or with a drop of rather concentrated carbolic acid. Of powders I know only one the application of which is not contraindicated,-viz., calonel, perhaps also icdol. Even this may irritate by its very form. Everything that is dry irritates and gives rise to cough or discomfort. Whatever has, besides, a had taste or odor, such as sulphur, indictorm, to quinine, must be avoided. Quidquid delirant medici Hectuatur agrati. Sugar has been recommended as a remacea, also table salt (1).

In bad cases of septic diphtheria applications of the tincture of the assiquichloride of iron have been highly recommended. The frequent doses of the tincture of chloride of iron introduced by me (see below) have the same, if no better, local effect. Löffler's solution of alcohol skxty, toluci thirty-six, and tincture of iron sesquichloride four parts is not preferable to many others. The injections of carbolic acid or chlorine-water into the tissue of the tonsils are objectionable in most cases, if only for the reason that they strike the least dangerous locality.

Hydrogen dioxide is a two-edged sword. It is certainly a disinfectant, but in contact with remous membranes it congulates the soluble albumin of the tissue. More or less extensive discolorations and pseudo-membranous deposits are caused by it, which are quite often large enough to be mistaken for diphtheritic. When they fall off there are sore surfaces ready for another invasion of bacilli or coccs. Many such cases get well only when the dioxide is stopped and a simple local treatment with lime-water substituted. By some the injurious action is attributed to the presence of acid in the drug, while others assert that the acidity is the cause of its beneficial effect (1).

For the purpose of dissolving membranes papayotan, or papain, has been employed. It is soluble in twenty parts of water, and may be injected, sprayed, or brushed on. I have used it in greater concentration, in two or loar parts of water and glycerin, in the mose, throat, and, through the tracheotomy tube, in the trachea. One of the irrepressible drug manufacturers and advertiners pushes the claims of a modification of the drug, which he calls papoid. For the same purpose trypsin is preferred by others. The mode of application of papayotin is no indifferent matter. When applied in powder, it resulted in constant irritation of the throat, while the patient otherwise was convalencent. The pluryngeal hypersemia and slight exudation disappeared when mild alum washes were substituted.

Diphtheria of the nore is apt to terminate fatally unless energetic local treatment is commenced at once. This consists in persevering disinfection and cleansing of the unucous surface. The disinfecting procedure must not be omitted long, became general sepsis results from rapid absorption through the surface, which is supplied with Jemph-duets and small superficial blood vessels to an anusual extent. Disinfectant or merely cleansing injections must be continued every bour for one or more days. If they be well made, the consecutive adentits, particularly that about the angles of the lower jaw, is soon relieved and the general condition improved. But there are cases in

which it is not the lymph-bodies that are the main gates through which constitutional poisoning takes place, but the blood-vessels only. In the incipient stage of such cases the discharge from the nostrils is more or less sanguineous; in them the blood-vessels, thin and fragile, carry the poison inward with great rapidity without any swelling of the lymph-nodes.

In a few cases injections are imsuccessful. They are those in which the whole misal cayity is filled with membranous deposits to such an eatent as to require foreible removal. Sometimes it is difficult to push a silver probe through them. This procedure may be repeated, the probe dipped in carbolic acid or wrapped in absorbent extron mulitared with carbolic acid of fifty or ninety per cent. After a while injections or irrigations alone will suffice. But now and then the development of pseudo-membranes is very rapid, a few hours suffice to block the nostrib again, and the difficulty is the same.

The liquids which are to be injected should be warm and fairly mild. Solutions of welimm chloride (6 to 1000); saturated solutions of boric acid; one part of mercuric blobloride, thirty-five of sodium chloride, and five thousand of water, more or less; or pure limewater; or solutions of papayetis, or a solution of sodium hypesulphite, will be found satisfactory. From the selection of these remedies it is at once apparent that the objects in view are partly to wash out and dissolve and partly to disinfect. I have not mentioned carbolic acid, which may be used in solutions of one per critical facts. Its employment requires care, for much of the injected fluid is swallowed, and proves a danger to children of any age, but mostly to the young.

Most of the syringes I find in my rounds are aborerations. The nearle must be large, blunt, and soft. After having recommended for many years the common hard-rubber ear-syringe, the sharp end of which was cut off, I now use always a short, stort glass syringe with noft-rubber mounting in front.

When the children cannot, or must not, be raised. I employ the same solutions from a misal cup, a spoon, or a plain hard-rubber atomizer, the nozzle being lengthened by a short piece of rubber tubing. These applications can thus be made while the children are lying down, every hour or very much oftener, without any or much annoyance. The nozzle should be large enough to fit the nostril. Sprays will never be so effective as injections or irrigations.

For a day or two these injections of fluids, or sprays, must be made hourly. It is not cruel to make the children out of their septic drowsiness, for it is certain death not to do so. Injections of the nose are oftener ordered than judiciously made. Hundreds of times I have been assured that they had been made regularly, hourly, for days in succession; still, there was a sendy increase of glandular swelling and sepsis. I never believe a nurse to have made them regularly unless I have seen her doing it. They usil run up their syringe vertically and not horizontally; the fluid will return through the same nostril. On the successful injecting or spraying of the nures hangs every life in a case of musal diphtheria. I have long learned to look upon a neglect to tell at every visit how to make an injection as a dereliction of duty. This may appear a trilling procedure, but it is a safe one. The nurse must be able to tell you that at every injection the fluid returns through the other nostril, or through the mouth, or that it is swallowed.

The procedure is simple enough, and need not take more than half a minute for both rostrils. A towel is thrown over the child's cirest up to the chin, and the child half raised in both by the person who is to make the injection. This person, sitting on the bed behind the patient, steadies the patient's head against her chest, while some-body else secures his hands. The syringe is introduced horizontally by the person sitting behind the patient, and gently emptied. No time must be lost in refilling and attending to the other side. There ought to be two syringes ready for use. When pain in the ears is complained of, in spite of great gentleness in injecting,—such cases will be found to be very exceptional,—more gentleness is required, or the spray, or pouring in from a spoon, or minim-dropper even, or, better, from a masal cup, must take the place of the injection. But get used to the injections.

Many sins are committed in doing this very simple thing. The unfortunate little one is allowed to see all the preparations, is worried and excited, and the necessary gentleness in the proceedings is neglected in too many cases.

For the purpose of softening and macerating pseudo-membranes steam has been utilized extensively. Its inhalation is useful in catarrh of the mucous membranes and in many inflammatory and diplotheritic affections. On mucous membranes it will increase the secretion and liquefy it, and thus aid in throwing off the pseudo-membranes. Its action in the more pronounced the greater the amount of muciparous follicles under or alongside a cylindrical or fimbriated epithelium. Thus it is that tracheo-bronchial diplotheria, so-called fibrinous bronchitis, is greatly benefited by it. Children affected with it I have kept in small both-rooms for days, turning on the hot water and obliging the patient constantly to breathe the hot clouds. Several such cases I have seen recover under that treatment. Atomized cold water will never yield the same result. Nor have I seen the patented inhalerdo much good.

Still, where the surface epithelium is pavement rather than cylindrical, and but few immorparous follicles are present, and the pseudo-membrane is rather immerged in, and firmly coherent with, the surface,—for instance, on the tonsils,—the steam treatment is less appropriate. On the contrary, moist heat is liable in such cases to favor the extension of the process by softening the hitherto healthy immous membrane. Thus it takes all the fact of the practitioner to select the proper cases for the administration of steam, not to speak of the judgment which is required to determine to what extent the espulsion of air from the stram-moistened room or tent is permissible.

Steam can properly be mixed with medicinal vapors. In the town of the patient water is kept boiling constantly over the freplace, provided the steam is prevented from escaping directly into the chimasy; on a store (the modern self-feeders are insufficient for that purpose and abominations for every reason); over an alcohol-lamp, if we can not do better; not over gas, if possible, because of the large amount of oxygen which it consumes. Every hour a tablespoonful of crude oil of turpentine is poured on the water and evaporated. The oir of the room is filled with steam and rapors, and thus contact with the sore surfaces and the respiratory tract is obtained with absolute certainty.

The secretion of the mucous membranes is sometimes quite abundant under the influence of steam, but still more, like that of the external integuments, increased by the introduction of water into the circulation. Therefore, drinking of large quantities of water, or water mixed with an alcoholic stimulant, must be encouraged. Over a thoroughly moistened mucous membrane the pseudo-membrane is more easily made to float and to macerate.

To evolve large volumes of steam the slaking of lime has been reserved to. It is both an old and an effective procedure. Not only is the object in view accomplished by it, but it is the bot means of bringing lime into contact with the morbid surface. In a most in which lime has been slaked everything becomes covered with it. Thus this method of profiting by the local effect of lime is decidedly preferable to the almost nugatory effect of lime-water sprayed into the throat.

It was to fulfil the same indication of softening the pseudo-membrane by increasing the secretion of the murous membranes that pilocarpine or jaborandi was highly recommended (Guttmunn) as a paraceu in all forms of diphtheria. There is no doubt that the secretion of the mittens membranes is vastly increased by its internal application and by repeated subentaneous injections of the muriate or nitrate of the alkaloid, but the heart is enfeebled by its use. I have seen but few cases in which I could continue the treatment for a sufficient time. In many I had to stop it because after some days of persistent administration I feared for the safety of the patients. Therefore, as early as at the meeting of the American Medical Association at Richmond, in 1880, I felt obliged to warn against its indiscriminate use in diplatheria. Thus it has shared the fate of the hundreds of remedies and methods which have been declared to be infallible and found wanting.

Diphtheritic admirs, the swelling of the certical glands near the angles of the lower jaw, to which I have alluded as an ominous symptom, points to rusal and naso-pharyngeal (mostly mixed) infection. The main treatment consists in disinfection of the absorbing surfaces.

Direct local treatment of the glands, if not entirely useless, is, at all events, of minor importance and efficiency. The application of an ice-bag of moderate size will render fair service. The use of one part of earholic acid in ten of alcohol irritates both the surface and the patient more than it can do good. Immetions may do some good by friction (massage); inunctions with some absorbable material in them may do a little better. The common potassium iodide oistment is useless; potassium sodide in three or five parts of giveerin is more readily absorbed; the same in equal parts of water, with a little animal fat and six or eight times its quantity of lanolin, gives an ointment which is so rapidly absorbed that indine is found in the urine within a few hours. Indoform may be utilized in the same way. Injections. of iodoform in other, which I suggested years ago, are too painful. Mercurial inunctions, those of blue ointment, require too much time for any effect to take place. Ofeates are too irritating locally; a fanolinointment would prove more satisfactory by doing less harm. After all, however, the readiest method of reducing the swelling of the glands and improving the prognosis accordingly is that of circums and disinfecting the held of absorption. The rare cases of suppuration in these glands require incision and disinfection. They are, however, as eminous as they are rare. There is, as a rule, little sus, but one or many local deposits of disintegrated gland-cells and gangrenous connective tissue. The incisions must be extensive; the secop and concentrated carbolic acid should be freely used. In these cases benterlages may occur, sometimes very difficult to manage. I have seen some of them terminate fatally. In these carholic acid must

be avoided. Compression, actual cautery, and acupressure have rendered good service. Solutions of iron must be avoided, for the seurf formed is a shield, behind which deleterious absorption is going on constantly in such wounds, as it does in the interus. Antipyrin in water (140 S or 2) is an excellent styptic.

The internal treatment of an average case of pharengeal dishtheria. can be made to combine the indications of both internal and local administration. For more than forty years I have employed the tincture of the chloride of iron. It is an astringent and an antiseptic. Its contact with the diseased surface is as important as is its peneral effect; therefore it must be given frequently, in hourly or halfhourly doses, even every twenty or fifteen minutes. An infant of a year may take three or four grammes (one drachm) a day, a child of three or five years eight or twelve grammes (two or three drachus). It is mixed with water to such an extent that the dose is baif a teaspoonful or a teaspoonful; a drachm or two drachms, with a small quantity of potassium chlorate (see above), in four ounces, allows half a teaspoonful every twenty minutes. No water must be drunk after the medicine. As a rule, it is well tolerated. There are some, however, who will not bear it well. Vomiting or diarrhosa is a contraindication to persevering in its use, for nothing must be allowed to occur which reduces strength and vigor. A good adjuvent is glycerin,-a better one than syrups. From ten to fifteen per cent of the mixture may consist of it. Now and then it is not well tolerated When diarrhora sets in glycerin should be discontinued. Still, these cases are rare; indeed, the storach bears giveerin very much better than the rectum.

In connection with this remedy I wish to make a remark of decidedly practical importance. I know quite well that recovery does not always prove the efficacy of the remedy or remedies administered; but I have seen so many had cases recover with chloride of iron, when treated after the method detailed above, that I cannot rescind former expressions of my belief in its value. Still, I have often been so situated that I had to give it up in peculiar cases. They were those in which the main symptoms were of so intense a septis that the iron and other rational treatment were not powerful enough to prevent the rapid progress of the disease. Children with mass-pharyngeal diphtheria, large glandular swelling, feeble heart and frequent pulse, thorough sepsis, besides irritable stomath,—those in when large doors only of stimulants, general and carefue, will possibly promise any relief,—are better off without the iron. When the circumstances are such as to leave the choice between iron and

alcohol, it is best to cenit the iron and rely on alcoholic stimulants mostly. The quantities required are so large that the absorbent powers of the stomach are no longer sufficient for both. Nor is iron sufficient or safe in those cases which are pre-emmently laryngeal. To rely on iron in membranous croup means muste and danger.

In this latter form of membranous croup, diphtheritic laryngitis, or laryngeal, also in general (pharyngeal and msal) diphtheria, the most useful internal remedy is mercury. Empiricism has often praised calomel in small and large doses. My acquaintance with mercury in this connection is not at all new. Many years ago I published (Med. Record, May 24, 1884) a number of my cases which got well under its use, at the same time that Dr. Thallon, of Brooklyn, published an article on the same subject. Since I have employed it (I prefer the bichloride), my conviction of the inter melessness of internal medication in larengeal diphtheria, so-called pseudo-membrarous croup, has been thoroughly shaken. Until about that time I felt certain of a mortality of ninety or ninety-five per cent. of all the cases of larvageal diphtheria not operated upon. These figures were not taken from small numbers, for I compared those of others with my own. The latter are not a few, either; for within thirty years (mthl about 1890) I have tracheotomized more than six hundred times, have assisted at as many more operations, and have seen at least one thousand cases of larvnesal diphtheria which were not operated mon at all. During the years from 1883 to 1890 I have seen no less than two hundred cases, perhaps many more. Among them recoveries have not been rare at all ages, from four months upward. The uniform internal medication consisted in the administration of a door of the bechloride every hour. The smallest daily dose ever given by me in the beginning was fifteen milligrammes (one-fourth of a grain) to a baby of four months; this was continued a few days, and the dose then somewhat diminished. Half a grain (0.03) daily may be given. to children of from three to five years, for four or eight days or longer. The doses vary from one-sixtieth to one-thirtieth (n.oct to acca). They require a diletion of one in eight thousand or ten thousand of water or of whisley and water. There is no stomatitis; gastric or intestinal irritation is very rare. It occurred in a few cases, but then it was found that the dilution had not been sufficient,-one in two thousand or three thousand only. Whenever it exists, very small doses of opium will remody it.

The benefit to be derived from the remedy depends greatly upon the time of its administration. Trachectomy or intubation is required, as a rule, after days only, and can often be avoided if mercury be given in time. If the operation becomes necessary after all, the treatment must be continued diligently. Never have I seen so many cases of tracheotomy getting well, since 1863, as when the bicklottide was being used constantly, since 1882. Nor am I alone with these favorable results. There are dozens of practitioners in New York City, besides Drs. Francis and J. Huber, with whose methods and results I am well acquainted, some of whom are connected with me in one or other capacity, who confirm the above statements.

My experience with the hieldoride has been mainly gathered in cases of largugeal and broughtal diphtheria, so-called pseudo-membranous croup and fibrinous broughtis: it is in these that it has been particularly effective. Still, but few of these were quite localized affections. Our cases of diphtheritic largugitis are mostly descending, and complicated with either diphtheritic pharyugitis or rhinins, or both. Not a few, mainly of the latter kind, exhibit constitutional symptoms of sepsis. Many such have also recovered.

Another method of using mercury is that of sublimating calomel in doses of from ten to fifteen grains, to be inhaled every few hours under a tent. It is particularly adapted to pseudo-membraneus

lanyagitis.

In any case of diphtheria there may occur conditions and complications which yield their own indications and require the closest attention on the part of the practitioner. I need not here refer again to the frequent attacks of exhaustion and heart-failure which carry off a multitude of patients, unless they be met in time. What I have said to previous pages on heart-failure and its prevention (or treatment) holds good in diphtheria, if anywhere. Therapeutical nihilism destroys more lives than any number of direct mistakes in dosing.

Nephritis, parenchymatous, interstitial, and glomerular, and the varieties of pacuscosia are frequent complications or consequences of diphtheria. The treatment of either of them requires so particular recognition in this place. Nor does ordern of the glottis yield indications differing from that occurring from other causes. Diphtheria of the skin and of the sexual organs requires disinfectant outments. I have mostly relied on indoform one part in from six to twelve of fat.

Diphtheritic paralysis, though of various anatomical and histological origin, yields in all cases a certain number of identical therapentical indications. These are: the austaining of the strength of the heart by digitalis and other cardiac tonics. A child of three years may take daily, for a month, three grains (0.2) or its equivalent; for instance, one grain (0.06) of the extract. This is an indication on which I cannot dwell too much. Many of the neute and most of the chronic diseases of all ages do very much better by adding to other medications a regular dose of a cardiac tonic. While it is a good peactice to follow the golden rule to prescribe simply, and, if possible, a single remedy only, it is a better one to prescribe efficiently.

Besides the above, there are other indicational mild preparations of iron, provided the digestive organs are not interfered with; strychnine or other preparations of mix, at all events. In ordinary cases a child of three years will take an eightieth of a grain three or four timesa day (together 0.002). Local friction, massage of the throat, of the extremities, and of the trunk, dry or with hot water or oil, or water and alcohol, and the use of both the interrupted and continuous currents, according to the known rules and the locality of the suffering parts, find their ready indications. The paralysis of the respiratory muscles is quite dangerous; the aprova resulting from it may prove fatal in a short time. In such cases the electrical current, used for very short periods, but very frequently, and hypodermic injections of strychnine sulphate in more than text-book doses, and frequently repeated, will render good service. I remember a case in which these, the occasional use of an interrupted current, and occasional artificial respiration by Silvester's method, persevered in for the better part of three days, proved effective. In a few cases of diphtheritic paralysisthe use of antitoxin appeared to meet with success. Other forms of paralysis (kemiplegia, ataxia) demand a treatment like the above. modified by their peculiar circumstances or symptoms.

In regard to antitoxin, there are but few opposing voices left. Not quite so efficacions as thyroid in myxxedema, it is more generally useful because of the vast number of cases benefited by it. There is no practitioner that has not at present the right-or rather the duty-to give it a place among his most reliable remedies. It would be a pity if many of us, on account of distance or other reasons for its inaccessibility, were deprived of its services and compelled so rely exclusively on the treatment detailed above. There are in the worst forms of diphtheria so many urgent indications overy one of which should be fulfilled, that the antidote of the circulating poison, if not on hand, will be sorely missed. For such a specific antidote it is, though it has not the power to cure every case of diphtheria any more than quining cures every case of malaria or mercury of syphilis. Not counting isolated cases spread over the journals, the three hundred original cases of Heubocr, five hundred of Baginsky, one thousand of Roax, and the many hundreds of the hospitals of Paris and Vienna, besides those of our own country, yield a basis on which to establish calculations. All observers agree on this point, that the sooner the

authorin is injected the more certain is its effect. Some go so has as to assert that no case injected the first day need die.

The doses to be administered are, according to Beltring, as follows: according to the severay of a case, six hundred, one stomanu, or fifteen hundred "antinoxin units" should be injected into a part of the body which contains loose subcutaneous tissue and is not exposed to pressure. This dose may be repeated if the symptoms are not improved within a day. A "unit" is equivalent to one cubic centimetry of what is called "normal serum." Normal serum is the blood-serum of an immunized animal, which has been made so efficacious that onetenth of a cubic centimetre will antagonize ten times the minimum of diphtheria virus fatal to a guinea-pig weighing three hundred grammes (ten ounces).

It appears to be a fact acknowledged by all that there is rarriv, of ever, an immediate bad result of the injection, which ought to be made into the subentaneous tissue, not into the sunseles. The point of injection should then be covered with antisoptic gauge or with iodoform collodion. Not infrequently, however, there is reduces, ery thema, or articaria around the point of injection. Besides, some of the after-effects are liable to be very severe. Urticaria, polymorphousemptions, petechie and suggillations, excessive perspiration, swelling of glands, severe pain and swelling in feet and limbs and joints, pruritus recti, severe durrhow and wemiting, nose-blooding, and great debility have lasted for weeks, yet terminated in recovery. Dr. Ranschenbusch observed on his four-year-old slanghter, who took throtimes the dose while sick with diplatheria two years previously, pruritox, urticaria, vomiting, sopor, and heart-failure, after two hundreunits injected for the purpose of immunication (Berl. Min. Work., (807, No. 32). A few sudden deaths have also been reported. No. connection between them and the antitoxin has been established in any rase, and verenresome generalizing speculations are not able to ilied light on obscure imbiects.

Dr. James Ewing* studied the effect of antiteein on the number and nature of leucocytes. While leucocytesis begins a few hours after the invasion of diphtheria, and increases, mainly as regards myelocytes, up to the climax of the disease and steadily declines during convalescence,—remaining high only in most of the had and fatal cases,—antitonin, according to Ewing, within thirty minutes after its injection, causes a reduction of the number of leucocytes. This reduction affects specially the unimiclear leucocytes, while the proportion

^{*} New York Medical Journal, August 17, 1808.

of well-stained multinuclear cells is increased. In favorable cases, after the injection of antitoxin the leucocytosis never again reaches its original height. In severe and less favorable cases the injection is followed in a few hours by more hyperleucocytosis and fever. In very bad cases the immediate result may be either rapid increase or decrease of leucocytes, and death. The multinuclear leucocytes found in the blood of favorable cases after treatment with antitoxin show increased affinity for gentian violet. This change may be observed within twelve hours after the injection, and its non-occurrence is a very unfavorable prognostic sign.

The existence of the after-effects mentioned above is not denied by any of the most enthusiastic admirers of antitoxin, but it is asserted that no serious or lasting results follow, and that if every life threatened by diphtheria were known to be protected by enduring the untoward effects of the remedy, we should willingly submit to them in every case. The balance of what we know of antitoxin is thus far layorable, and this addition to our therapeutical powers will forever be remembered as creditable to Fmil Beliring. It is a pity that he should not have been satisfied with his epoch-making results; if he were a clinician he would be less extravagant in the expression of his opinions and more modest. If he were he would not have been tempted to assert that organotherapy has accomplished nothing, that cellular pathology has proved sterile, that remedies combat main symptoms only, that medicine hitherto had therapeutical principles only but no therapentical experiments, and that (his) experimental therapeuties is in conscious opposition to medication (German Congress of Int. Med., June, 1867).

Altogether, the effects of antitoxin injections are entirently favorable. The fever of diphtheria is much lessened within or after a day, and the second fever-wave—so common between the third and the fifth days—is not often observed. The membrane is speedily disintegrated and disappears on the sixth day or sooner, while in cases not injected with antitoxin it lasts eight days or longer. Besides, there are but few cases on record in which the membrane returned after antitoxin, and not many in which it grew larger. In 181 cases of Heithner there were but three relapses. Albuminuria and nephritis are common occurrences in diphtheria as early as the (second and) third day. Among these 181 cases, of those injected on the first day, five-sixths remained free; on the second, two-thirds; on the third, one-half; on the fourth, one-third. The results of Baginsky, Roux, and Widerhofer are similar. In 525 cases of Baginsky treated with antitoxin there were albuminuma in googs per cent., clini-

cal replicitis in 12,57 per cent., and post mortem replicits in 15,80 per cent. However, among 933 cases treated without antitoxin there were albuminuria in 42 per cent., chincal replicits in 25,78 per cent., and post-mortem replicits in 16,31 per cent.,—rather a favorable showing for antitoxin. In his 525 cases, heart-failure was noticed at the cause of death in eight; it occurred in 5,69 per cent. of all the cases, while it took place in 10.9 per cent. of the 933 treated without serum from 1891 to 1894. In Heubner's practice it occurred nine times, but was not fatal.

It is asserted that whenever antitoxin is injected before laryngeal stenosis has developed the larynx will remain free. That is an exaggoration, but it is certain that both trachestomies and intribations have become less in number, and the speedier disintegration of the membranes and the (almost general) discontinuance of their growth after the injection of amitoxin bave made it possible for intulation to take the place of trachestomy in nearly every case of operative interference.

Paralysis is no less frequent in antitoxin cases than it was formerly. But we must not lose sight of the fact that it never was exclusively found in very bad cases, but quite often after mild ones. Perhaps it results more from a mild but protracted poisoning than from a seddlen and severe one. It may be, also, that many cases which survive with antitoxin and develop paralysis would not have lived to become paralyzed under a less satisfactory treatment.

The principal question, however, to be raised in reference to any medication in cases of serious disease is its life-saving power. In as issue of August 8, 1895, the Deutsche medicatische Workenschrift published a preliminary result of its collective investigation of auti-toxin treatment. The report refers to 10,312 cases of diphtheria treated in the city of Berlin and outside.

It showed that the milder cases, in which six Immdred units were considered enough, did best; that those which from the beginning offered a worse prognosis were given more antitoxin and did not behave so well. That means, among other things, that, in proportion, mild cases do better under any treatment than severe ones. It also proves the necessity of not relying on a single method of treatment exclusively.

Among the most enthusiastic enlogizers of antitoxin there is note but admits failures. Many of these are attributed to insufficient strength of the serum. Mere serum of an immune minual does not suffice. Others—and those are the most conclusive—depend on the insufficient power of resistance on the part of the patient. That is

why the authoris injection alone thould not be relied on. Nutrition and alcoholic and other medicinal stimulation must be resorted to. In regard to other treatment the authorities differ. Some, like Escherich. Baginsky, and Roux, favor it. Escherich particularly after the membranes have fallen off. Henbuer rejects it. At all events, there are but few left who maltreat the child by the former cruel methods of local applications and cauterizations. It should not be overlooked that the antitoxin does not destroy bacilli, which continue the evobution of soom persistently. I have advised, whenever I had an opportunity, the combination of my mercurial treatment with the antitoxin, for the reports on the efficacy of mercurial treatment as recommended by me (p. 241) are becoming more and more favorable. Benney's Australian reports are very conclusive." Some New York friends, to whom I offered antitoxin, declined it, declaring themselves fully satisfied with the results they obtained from mercury and intulation. On the other hand, a townsman of ours who handles antitoxin a good deal pronounces mercury and untitoxin to be incompatible, and believes that mercury will interfere with the effect of antitoxin. This assertion has not been proved, but shows the facility with which postulates may be substituted for experience during a period of enthusiasm. No greater enlogy, both on mercury and on antitoxin, can ever be pronounced than the figures detailed by Dillon Brown and referred to below.

These results tally perfectly with the very exhaustive report of the hospitals of the London Metropolitan Asylums Board (London Lowert, June 5, 1897), which for the year 1896 proves a great reduction in the mortality of cases brought under treatment on the first three days of illness, the lowering of the combined general mortality to a point below that of any former year, the still more remarkable reduction in the mortality of the laryngeal cases, the uniform improvement in the results of tracheotomy, and, finally, the beneficial effect produced on the clinical course of the disease (N. F. Med. Roc., September 4).

Additional statistics concerning the effect of antitoxin are too numerous to be reported here. The collective investigation of the American Pediatric Society, of 1895, the results of the Boston City Hospital and of numerous other institutions, and those of painstaking practitioners all over the world are manimous in regard to its effitiency and to the lowered mortality following its use. The doses are, however, larger than those employed at first. Thousands of units are easily home, and are required in bad cases.

[&]quot;Acutralian Medical Journal, January 20, 1805.

So far as immunization through small doses of antitoxin (from three hundred to five hundred units) is concerned, it appears to have been accomplished, in the opinion of many: but they all agree that it does not last over a few weeks. Those who know that diphtheria, once introduced, predisposes rather than protects will have no particular confidence in the effect of antitoxin as an immunion, except to bridge over a number of dangerous weeks; but as in full doses it saves the lives of many who are stricken, its aphere of mefulness is indeed extensive enough.

20. Rheumatism.

Acute articular rheumatism is frequent both in infancy and childbased.

Since I made this statement meanly thirty years ago," after obsersations extending over more than twenty years, a few authors have accepted and verified it; but the majority are still of the opinion, inherited from their predecessors, that infancy and childhood are immune or almost so. Thus, only seventeen years ugo Edlefsen reported to the German Congress for Internal Medicine (Transnerious, 1885, p. 323) but eleven cases of acute thenmatism under five years, none of which was younger than two. The assertion that the disease is rare under four or under two years is frequently met with

Nothing can be more erroneous. The frequency of valvn'ar discases, mainly of the left side of the heart, in children of from four or five years to adolescence ought to suggest the frequency of rhemmatism; for but few of them are the to scarlating and very few to syphilis; almost all are secondary to rheumstism, then which there is no more frequent cause of cardiac disorder. They cannot be claimed as congenital. for the fact that very few of the foetal diseases of the heart are found on the left side, and but a small number survive the first (or perhaps second) year, remains undisturbed. Nor is the number of rheumatic cases limited to those exhibiting cardiac symptoms; for though endocarditis is of more frequent occurrence-compared with the number of cases-in the rheumatism of children than in that of adults (in whom from ten to twenty per cent, contract a permanent organic lesion of the heart), still, there must be, and are, many cases of semi-rhemistism which run their full course without terrainating in heart flicase. In order to ascertain this, the heart must be watched in every doubtful case. Endocarditis is sometimes the first symptom of acute rhemostism in children, and procedes every other, even in

^{*} A. Jacobi. Aritte Rhittroffem in Leftney and Childhood, 1872, in a territori American clinical lectures, edited by E. C. Seguin, M.D., vol. 1, No. 2

apparently mild cases, and pericarditis and myocardial changes are not rare. When the slightest symptom of chorea minor shows itself, the heart should also be examined together with the joints, for there are cases in which chorea is not the final development of rheumatism and rheumatic endocarditis, but the very beginning of the disease, and then referable to a rheumatic affection of the spinal membranes or of the heart muscle.

All of these remarks I believe to be opportune because of the frequency of cases in which the persistent notion that rhomatism is a rare disease given rise to an erroneous diagnosis—the ubiquitous "dentition," "worms," "malaria," and "coda"—and to false treatment. After all, a correct diagnosis is the foundation and nine gos tow of sound therapeuties; thus I shall, in this neglected instance, add a few words on the subject of diagnosis, which is sometimes quite officials.

Fever is a common symptom in small children; every physical disturbance raises their temperature. In acute rheumatism it is often but slightly elevated; it sometimes rises at irregular times, being now and then highest about noon. The swelling of the joints is apt to be very trifling and is often overlooked; the pain (either spontaneous or on pressure) may be very much less than that resulting from fatigue, rhachitis, syphilitic home disease, colic, or otitis. Thus in every doubsful case of disconfort or pain the joints and beart should be examined for rheumatism. The diagnosis of acute articular rheumatism becomes quite difficult when but a single joint is affected, either temporarily or through the whole course of the attack, for a unilateral arthritis is very apt to be tuberculous or transmitic. Still, rheumatic monarthritis is observed principally in the hip- or knor-joint. Sometimes, after a week only or still later, the additional inflammation of other joints facilitates the recognition of the exact condition. Isolated inflammatory rheumatism also often fails to be recognized because of its being denominated "growing pain." The latter term dates from the medical nomenclature of post centuries, and ought to have been dropped longago. What has been called by that name is of variable origin and nature. Sometimes it is fatigue only. It may be neurosis of a joint with or without an ordenatons swelling. I have seen a number of such instances in children of both sexes, about the shoulder-, hip-, and knee-joints mostly. Another affection which has been classed under the heading of "growing pain" is rhachitical or other epiplicaitis and congestive swelling of the intermediate cartilage of the long bones. It is of frequent occurrence, without a perceptible cause besides the physiological hyperamia which is required for normal growth, and

liable to become pathological; it is often noticed in convalescence or recovery from infectious fiscases, particularly scarlatina. Still, the large majority of attacks of "growing pain" mean rheumatism; it is the failure to appreciate this fact that constantly gives rise to mistakes in diagnosis and neglect in the administration of both perventive and curative measures.

That a rheumatic affection of one or more joints should not be mistaken for scurvy (joints hardly ever affected) or for polionyelitis is self-understood.

Rheumatism of the cervical part of the vertebral column is apt to be very painful and attended by high fever, stiffness of the neck, retracted head, delirium, and sometimes vomiting. Some of these symptoms are those of cerebral meningitis, and errors in diagnosis are easily made. Stiffness of the dorsal part is not always osseous. but sometimes rheumatic (figumentary and muscular apparatus).

There is no uniform cause or character of elementism. Staphylococcus aureus and progenic streptococci, mainly streptococcus citreus and diplococcus, have been met with. Their virulence is not always the same; its modification may explain the vehemence or the mildress of the attacks and the many varieties between a hardly perceptible pain and the worst symptoms of pyaemia. Does that mean that one or all of them are the origin and formtain of rheumatism, and that perhaps the latter is the result of many different infections by progenic coccu whose virulence is lessened? Besides, there are certainly cases of "rheumatism" which are not microbic; those connected with psoriasis seem to be neuropathic, those with erythema multiforms nonmicrobic, and the inflammations of joints occasionally caused by (Kiebs-Loffler) diphtheria antitoxin are surely not so.

The essential character of rheumatism becomes still more dubicus when we consider those cases of joint inflammation whose connection with known infections diseases can be proven. They are called shee matoid, and exhibit either pain or inflammation or suppuration. They follow typhoid fever, desentery, parotitis, genorrheas, premioria, diphtheria, inflamma, corebro-spinal fever, scartatina and other acute examthemata, honorrhagic diathesis, and catarrhal angina, also syphilis. Pharyngitis has long been known to be connected with theumatism, or rather to precede it. It is assumed with more than mere probability that the cocens invasion which is the cause of what we call rheumatism takes place through the pharyngeal lymph-hodies, the separate follicles, and the ionsils. That is why there is no better preventive than the hygiene and treatment of the mouth and throat, from mere systematic elegaliness to resection of tonsils and removal

of adenoids. The contents of the joint were found to differ in generrhora, presumonia, diphtheria, and erysipelas; now and then the heart will be affected, reasoly in scarlatina. In but few of them has safetylic scid the same effect as it displays in the majority (only) of genuine, independent, sente rheumatisms. In most of them antipyrin (with or without safetylates) acts better than safetylates alone. In syphilitic arthritis, however, it has no effect at all; joildes only are useful.

Altogether, the treatment of neute articular rheumatitus has been unite instatisfactory down to a modern time. A few of the indications are furnished by the actual or alleged causes of the disease. By some It has been believed to be endenie; it is certain that some localities have been known to harbor a great many cases at the same time. In these, a change of residence, if practicable, ought to be resorted to. provided the individual case is but one of a great many in the same neighborhood. Contagion has now and then been presumed to cause the spreading of the malady, but the number of observations of the kind is very limited indeed. The greatest possible care bestowed on those sick with infectious levers will prove a powerful preventive of thermatic fever. The blood has been found to be changed during the latter affection: the red-cells and hamoglobin are diminished, the white cells and fibrin increased. According to many writers, both chemists and physicians, the alkaline condition of the blood is less pronounced. This change, or the actual prevalence of acid in the "Mood, has also been either proved or assumed to exist in cachecnic conditions of many kinds, in fevers, uramia, leucocythemia, diseases of the liver, in poisoning with acids, lead, and mercury, in pyaestia, typhoid fever, gout, and diabetes. In them, as in acute themsatism also, factic acid has been found in undue proportion. It is the same acid which has been found in over-exerted muscles; still, when introduced into the circulation it never produced articular rheumatism. The diminution of the alkali of the blood would justify at once the administration, through the whole course of an acute rheumatism, of alkaline salts, and particularly potassium; the latter is greatly diminished, according to Beneke, who, besides its relative absence, looks upon the impairment of nerve-power and the accumulation of organic acids as the main factors in the pathogenesis of rheumatism.

Sudden changes of temperature are certainly among the causes of acute rheumatism. Cold and moist weather, moist houses, and exposure to wind and rain will bring it on. This effect may be immediate, and consists in the sudden suppression of the cutaneous circulation and climination, or gives rise, by reflex action, to vasomotor or trophic disturbances in the joints. Particularly is that so in those who have inherited a morbid disposition. Such an inheritance is not at all infrequent. I have seen acute rheumation in several children of a rheumatic father or mother. The treatment of such cases must be mainly preventive. The tendency to be influenced by sudden changes of the surrounding temperature can be modified or removed by the systematic use of cold water. Children with a disposition to rhoumatism should have a daily cold wash, sponge, or bath. The former is the mildest moste of application. They may be rubbed down with a wet sheet, and afterwards with a warmed dry and coarse hathing towel. Those who have been strengthened by this procedure, or such as are stronger, may be sponged, or use a shower-both for a few seconds, or a cold both. These will be well tolerated and prove useful when the surface, mainly of the extremities, becomes warm after moderate dry friction. For such children as feel chilly after these apolications treatment may begin with tepid water and alcohol (4 or 6 to 1). I ought to add here that this treatment will accomplish its end best when throughout the rest of the day great care is used to protect the surface. A cold wash or both, given to harden and strengthen, must be combined with warm clothing and bedding to protect. Nothing is more injurious than exposure of the surface to wand and rain. The bare knees and calves of the children of vain mothers are foolbardy provocations to the invasion of many serious diseases. Sea-bothing is a first-class roborant, except in the presencof heart disease.

The weolfen and painful joints must be protected against the pressure of blankers or painful handling by raising the bedclothes, keeping the limbs in a basket of proper size (waste-paper hasket), and covering them thickly with cotton. Well-covered splints add greatly to the comfort of the patient. When pain and swelling are unusually severe, the application of an ice-hag or ice-cloth is advisable. Very young or anamic children do not bear them long. Cold water will then take the place of ice-water or ice. A wet bandage or pack round the affected joint is often borne well and relished. It ought to be changed every hour or half-hour. Very amenic and neuronic patients prefer hot and dry applications, mainly in those cases in which the pain is the principal symptom complained of. To relieve the latter I cannot advise the subcinaneous injections of carbolic acid which have been recommended; in very severe cases I have been compelled to administer a few drops of a solution of morphine hypodermically. As a rule, however, morphise ofeate or a mild solution (from two to four per cent.) of cocaine muriate on the skin, chloroform linkment brushed on, chloroform powred into the cotton surrounding the

joint and retained by oil silk, or a very mild galvanic current now and then, also the application of oil of wintergreen and of cintments containing for or twenty per cent, of sedium salicylate will give some relief.

The swelling of the synosish membranes and ligaments in retarded convalesomor or chronic cases taxes the patience of both the sick and the physician. Vesicatories kept on for half an hour only, and frequently repeated; the wet bandage or pack singly applied so as to compress gently; compression to bandages or collection; gentle massage; and the galvanic current daily applied find their indications in many and various cases. Indine will come in for its share of medulasss. Besides the internal administration of the iodides (potassium or sodium, or both combined, in doses of from five to twenty grains daily [0.3 to (.25]); the external applications will be found beneficial. The official ointment will act through the gentle handling and kneading necessitated by its use. Solutions of potassimm iodide in glycerin will act better, but are inferior to the lanolin ointment referred to in a former chapter. Superior to all, however, is the application, twice daily, of one part of indoform in from eight to fifteen of collodion or flexible collodion. It is brushed over the swollen part copiously, and allowed to dry while the limb is kept absolutely at rest for ten minutes. Only such scales as become detached spontaneously may be temoved; otherwise the next application is made on top of the preceding ones. Very old cases, with chronic effusion into the joint, require aspiration and washing out. These manipulations have become safe in the hands of every physiclan who has learned the use of scap and of disinfectants on himself and his instruments since operative surgery availed itself of the immense progress made in pharmacological laboratories.

Endocarditis demands absolute rest, both of the organ and the body. Every exertion will prove injurious. Thus an occasional dose of optim or of a bromide, or of both combined, and the use of potassium indide in daily doses of from one-half to one gramme, have a good effect. The application of an ice-bag to the cardiac region, or, when that proves too heavy, an ice-cloth, acts very favorably indeed, But not every nurmar means endocarditis; it may be the result of muscular incompetency or irregular contraction only, and quite temporary; it is sometimes observed in cases of but moderate severity, and mainly combined, or alternating with, or preceding chorea minor, which now and then makes its appearance in the very earliest period of acute rheumatism. Both choren and endocardins can be mitigated or prevented by early attention. If every case of incipient rheumatism

were sent to bed, if no case of "growing pain" were allowed on the play-ground or at school, many a life-long ailment or early death would be avoided.

The temperature is rarely high, or rather there are a great many cases of articular rheumatism in infants and children in which the temperature is as little elevated as the rest of the symptoms are orgent. But there are such as have rectal temperatures of from 104" to 107° E, and more. It is in these that delirium and other cerebral symptoms, with paralytic respiration and collapse, may make their appearance, and that the most efficient antipyretics must be employed: among them the cold pack, as described in a former chapter, applied to the trunk and lower extremities as far down as the larges, is the readiest and most effective remedy. It is particularly indicated in cases complicated with endocarditis; it is in these that antipyrin and phenocetin will not always have a pleasant effect. All of them are inferior to sodium salicylate as regards antirheumatic and antipyretic action. A child of three years may take from six to ten grains (0.4 to 0.6) every two or three hours, for one or more days. This is the less damperous the more the symptoms of overdoses are understood. When they appear (mainly the brain symptoms, tinnims, stupor, paralytic or interrupted, sighing, respiration) ample time is given for the discontinuance of the drug; a single large dose for the night, of from ten to twenty-five grains (0.6 to 1.5), succeeds better, sometimes, than the many smaller ones. As a rule, sodium salicylate mitigates the sumptoms of pain, swelling, and fever very soon. Many of the patients feel very much better after the lapse of a day; then the doses may be diminished or administered at longer intervals. Longer than from three to five days it ought not to be given; if no effect, or an insuffirient one only, be obtained after that time, no further reliance need be placed on it. Then antipyrin, aspino, from eight to twenty grains (0.5 to 1.25) daily, or phenacetin may accomplish what the salicylate failed in. In the same way salol, salicin, and cresotic and benzoic acids have been recommended. Lactophenin has proved misatisfactory. Salipyrin in three or four daily doses of from four to ten grains (0.25 to 0.6) acted more favorably.

At the same time, particularly when there is a constant tending on the part of the temperature to rise either permanently or periodically, quinine sulphate (or another preparation of the drug) may be administered in one or two doses of from three to eight grains (o.a to 0.5) each. The most opportune time is the period of remission, which mostly takes place in the morning. Alkaline salts may be given with the other medicaments, alkaline mineral waters, such as Seltzer or Viciny, or sedium bicarbonate, from a scruple to a drachm (1 o to 4.0) daily, or potassium citrate or hitartrate, or one of the intrates which have formerly been credited with almost a specific action. Vegetable acids have been warmly recommended, such as citric acid. They take the place of alkaline salts, inasmuch as they are eliminated as carbonates. Potassium and sodium tolides are esteemed very highly,—justly so, indeed,—particularly as the undency to chronicity renders desirable the persistent action of a powerful absorbent. Of the other remedies which have been given for their alleged specific effect (colchicum, colchicin, veratrum, aconite), I have seen but little result in acute rheunatism of infancy and childhood. They, too, render better service in cases which have become or are fast becoming chronic.

During the attack of an acute or subacute articular rheumatism the diet should be strictly milk, farinaceous food, light vegetables, and fruit. Meat and alcoholic heverages are positively forbidden. Plenty of water.

Gouorehead articular rheumatism is not excessively tare among infants and children, though direct sexual intercourse be not frequent at that age. It is not confined to one or a few joints or to those of the lower extremities; it is mostly subacute; the effusion is liable to be excessive and apt to be purplent. The latter condition, being dangerous partly to the joint and partly through its tendency to infect the body, must be watched carefully; for it is often the beginning, or part, of a general pyannia; in a few instances I have seen the eye destroyed by panophthalmitis in twenty-four hours, and the child died, after weeks of suffering, of the general infection. There are also cases of sentic endocarditis. The cause is often what is easily taken for a common vaginal catarrh, but is gonorrhea. The long time the latter may be concealed, unchanged in its contagiousness, within the vagina of the adult, and the facility of communicating it to the young by direct contact or mediate communication through towels, heddiothes, etc., yield a due to certain otherwise unexplainable cases. In a small children's institution I saw a dozen cases at one time. The treatment of the diseased vagina has its own indications; that of the joint affected with gonorrhoal rheumatism must be more local than the average case. An aseptic poneture may be made for the perpose of ascertaining the contents of the synovial cavity. If there he pas, it must be removed and the cavity washed out, thoroughly disinfected, the limb rested on a sulint and gently compressed; if serum in large quantity, puncture way become necessary when other treatment proves unavailing. Otherwise gentle but steady compression by handages, with or without scenarial plaster underneath, or by indoform collodion, is indicated; at the same time the use of sodium salicylate and potassium and (or) sodium iodides must be continued a long time.

During and after an attack of acute articular rheumatism there will be noticed, occasionally, small neoplasms on tendons and the insertions of muscles, on fascize, and on periosteum, varying in size, musbers, and sensitiveness, which consist of voung connective tissue with numerous cells, last from a few days to several months, and give rise to but little elevation of temperature. Sometimes they are the very last, or only remaining, symptoms of the disease; now and then a new endocarditis has been observed with them. This wodwlated rhrussatiese, "thermatismus nodosus," is very much more frequent in children than in adults. In the case of a boy of eight years the insertion of the occipital muscle was the principal seat of the nodules, ilozens of which, from the size of a pea to that of a small hazel-nnt, could early be distinguished. From syphilitic gumnata, fibromata, goot, and cutaneous tubercles they can easily be discriminated. Special theraperties for this form, besides what has been mentioned, there is none; but endocarditis is of frequent occurrence.

Pelionis rhemustics is the name of a peculiar form of more or less localized purpura. In some cases of rheumatism a large number of small subcutaneous and cutaneous hemorrhages appear mostly on the lower extremities and socially round the joints. Now and then they are painful, but frequently not sensitive at all. In this they do not differ from common purpura. In a number of cases of peliosis the heart was not found affected, and the inference has often been drawn that peliosis is not "rheumatism" at all. Indeed, purpuric hemorrhages are often noticed in other infectious diseases (typhoid, measles, whooping-cough, pneumonia, Bright's disease, syphilis, mercuralism, pyzemia, etc., according to the number and simulence of ercei circulating in the lymph- and blood-currents) and not infrequently round the malleoli and the joints in general (maybe in consequence of the impediment to circulation resulting from the smaller amount of subcutaneous fat and consequent tension of the integument in those regions), and in a number of instances the accompanying articular pains of such constitutional diseases are best explained by the presence of hemorrhages inside. Still, peliosis will sometimes appear quite early in scute rheumatism; these are the rases which were classified as a specific variety, and that is why peliosis was asserted to be a specific rheumatic affection. If so, it requires antirheumatic treatment; but the structural condition of the walls of the blood-vessels (and insufficient innervation and the presence of specific bacilli)), which causes the hencerlages, indicates the early administration of roborants and cardine stimulants through the whole course of the disease, and great caution in the doses and quantities of sodium salicylate, which has rather a disposition to increase the humorrhagic tendency. Aspirin may take its place.

There are a great many varieties, or rather degrees, of peliosis, similarly to what we know to take place in purpura. According to whether the hemorrhage takes place near the surface or in the deeper tayers of the tissue, both the color and the massiveness of the hemorrhage will differ. In some cases the result is an crythesta, which has been called either papaloxam or nodomus, from the differences in the results of inspection and palpation. It is observed in both severe and mild cases of articular rhemiatism; it is somewhat raised above the level of the skin, sometimes deeply inserted and then circumscribed, and frequently found near the joints. In accordance with the indications imposhed by rhemiatismus nodosus and peliosis, no special therapeutics is required for this form.

Chronic peticular elemention is rate in childhood. reports the case of a girl of two and a half years whose rheumatism began with an acute attack, became chronic, and was finally enroll by the galvanic current administered for a long time in succession. The voungest case of mine, also a girl, was five years old. She was puny and feeble and her general putrition defective. A number of the large and small joints, particularly of the hands, were affected, and the tumefactions of the ends of the bones were quite marked. There was neither an affection of the voluntary muscles nor of the heart, and no disease of any part of the nervous system, which Mitchell (1831) and Charcot (1868) found to be the cause of "arthropathic" swellings. The treatment is about the same as that resorted to in the same disease when met in the adult. Solimn salicylate should be given in those cases only which exhibit acute exacerbations. Colchierra, aconite, iodides will take its place, and will be required for a long period. Small doses of arsenous acid, from one-three-hundredth to one-five-hundredth of a grain (one-eighth to one-fifth of a milligramme) every two or three hours, will answer well. Prolonged warm, salt-mater (cold or warm), and sulphur baths will improve many a case, so will galvanism and massage. Others will be benefited by dry heat of a high temperature; in hed or in an apparatus, which increases tissue metamorphosis to a remarkable extent, mainly the amount of uric acid. As external treatment a diluted tineture of lodine, todoform ointment, indoform collection, or potassium indide and lanolin ointment may render good service. Narcotics are seldom required. Good results are obtained by the protracted use of alkaline

waters. From what little I have seen of chronic rheumatism in children, and the many cases of the same disease in adults, I recommend strongly the use of large quantities of water, to which is added from a scrupfe to half a drachm (1.0 to 2.0) of potassium bicarbonate, as a duity dose; also lithium carbonate in duity doses of from four to ten grains (0.25 to 0.6). Our natural lithia waters contain too little lithia to have any effect except through the large amounts of water consumed.

Muscular rheumatism can be diagnosticated occasionally in very young children; in those from six to twelve years it is not quite rare. Its nature and symptoms do not differ from those in the adnit. The neck, back, and shoulders are most frequently affected. The best preventive is the habitual use of cold water. Diaphoretics are not very useful. Narcotic and stimulating liniments find their own indications. Morphine cleate is of but little use: in a severe case I have injected a small dose of morphine with immediate and permanera effect. The interrupted current acts promptly in one or more sessions. Softum salicylate, antipyrin, aspirin, and phemocrin have some effect, in proper doses and frequently repeated. Semmola's experience in a severe case of neuro-muscular rheumatism is worth remembering. The case was that of a woman of forty years, who suffered from stillness and pain in a shoulder and right arm, with good possive motility of the joint. After the pain had lasted several months, massage, electricity, quinine, and salicylic acid having proved inefficient, the patient was relieved in a few days by a few subcutaneous doses of one-twelfth of a grain of pilocarpine.

It is in rare cases only that the rhemmatic process in the muscle assumes the character of an inflammatory affection. Then there is, as in every myositis with a tendency to chronicity, a hyperplasia of the connective tissue between the fibrillar, the muscle becomes hard and somewhat shorter, and its electrical irritability grows less or disappears; even the skin participates in the process. Such a case I over observed in a boy of twelve years. He was never entirely relieved, but greatly improved by massage, warm bathing, a wild continuous current, and the internal administration of hydrargyrum highloride. The treatment was continued for more than a year. These cases appear to prove the identity or similarity of rheumatism, no matter whether in the joints or muscles (I. Ailler and others).

21. Influence.

Epidemic broachitis (influence) can be prevented only by avoiding contagion, which is even more difficult than it is to escape measles.

Its treatment depends a great deal on the variety; the catarrhal, gastric, and intestinal symptoms require early attention, for nervousexhaustion is imminent in every case, and many patients suffer more seriously from the sequela than from the original attack. Antipyretics cannot always be avoided. Phenacetin, antipyrin, and sodium salicylate, combined with a cardiac stimulant, may be thus employed. particularly when muscular pain is one of the prominent complaints. Quimme also finds its ready indication. Opiates are often required, either in small and frequent doses or in a single larger dose to secure sleep. Inhalations of steam, two per cent, of carbolic acid having been added to the water, have been highly recommended, but whatever adds to the bronchial irritation and produces cough should be avoided. Rest in hed is required long after apparent recovery, for collapse and nervous symptoms of many kinds are liable to appear during convalescence, and there is no case, though apparently ever so mild, that may not prove grave. Besides vomiting, diarrhora, high temperature, great lassitude, and all the symptoms of catarrh and inflammation of the mucous membranes, complications with serious forms of premionia, sometimes enterrhal and croupous in combination, and pleurisy, of diseases of the heart and blood-vessels (thrombosis, phielitis) and the sensory organs, and of the nervous system (mental (fisorders included) are frequent. Ostomyelitis and laryngeal and tracheal perichondritis are occasionally met with, also inflammations of joints, which are mostly intolerant of massage or compression. Nephritis is an early complication. Among the ocular symptoms conjunctivitis is frequent, keratitis and initis are met with, in-dochoroiditis and retinitis are not so frequent as acute glaucoma. Now and then atrophy of the optic nerve has been observed. Ouris media with mastoid abscess is not uncommon; hemorrhagic myringifis requires Incision. Meningitis and pyarmia are among the sequelar. Most frequent is after exhaustion, which appears to be more than merely functional, and requires for weeks and months (years) the most careful and persistent roborant and stimulant measures.

22. Pertuzzia

The mortality from schooping cough in New York City is as great as that from typhoid fever. Twenty-five per cent, of all the cases under a year terminate fatally; five per cent, of all those between the first and fifth years, and one per cent, of all those occurring after the fifth. Its direct mortality, however, is not the only danger, for not infrequently chronic laryagitis, pneumonia, emphysema, dilatation of bronchi, and the result of hemorrhages which occur during the attacks (convulsions, paralysis either general or local, blindness) impair the health of the patient for many years or a lifetime. Thus the tendency to allow whooping-cough to run its full course on the plea that it is a nelf-limited disease, or that every child must have his whoopingcough, is not justified.

The prevention of whooping-cough, which is a specific and contagious disease, is certainly not easy, for the reason that contagion may take place very suddenly, and through the first and second stages of the shoease, both of which extend over a large number of weeks. Contagion may take place, whether or not the disease be occasioned by micro-organisms, by means of the exhaled air, or mucro, or the masses brought up by counting. Prevention means protection against the effects of all these factors.

As the disease is spread by contagion only, isolation is an absolute necessity, difficult though it be. In public institutions it is well-nigh impossible. Thus no patient ought to be admitted to, or allowed to remain in, a public school or a hotel inhabited by children. Children with whooping-cough must not even be permitted to congregate in large numbers, because the cases will become more severe by mutually affecting one another. In one point only isolation is more effective in whooping-cough than in other contagious diseases,—namely, that the disease does not appear to be carried by persons not thus affected.

The air must be kept pure, uniform, and moderately warm. The patient should be out as much as possible. No draught, however, must be permitted. Utentils must be kept clean and be disinfected, and the masses brought up by vomiting disinfected, destroyed, or removed. The mucous membranes should be kept in, or restored to, a healthy condition, particularly those of the mouth and respirately organs. No injudicious exposure must be allowed. The digestive organs must be matched, the stornach must not be full at any time, the bowels kept regular, the food digestible.

So long as the microbic cause of the disease is not known (by different investigators different bacilli and cocci are charged with being its cause), and therefore no causal indication can be fulfilled, the objects of treatment are limited as follows: to relieve the severity and diminish the number of the attacks, to procure quiet nights, to stop the vomiting, to shorten the course of the disease, and to prevent detrimental consequences.

An important indication is that of treating a catarrhal or inflamed inucous membrane. It is quite possible that a see mucous membrane only is capable of admitting the contagion of whooping-cough as it mustly does that of other infectious diseases,-for instance, diphtheria. Besides, by attending to the mucous membranes in time, the occurrence of serious complications, such as pneumonia, may be prevented. Catarrit of the mouth and pharynx ought to be treated with doses of potassium chlorate of from half a grain to a grain (0.03 to 0.06) in a teaspoonful of water every hour, and a large number of expectorants find their reads indications in such cases. All of those which have a depressing effect should be avoided, particularly antimonials. Even ipecae should be given in small doses only. Alkaline waters have a beneficial effect. Ammonium muriate in doses of from half a grain to two grains (0.03 to 0.125) every hour or two hours will liquely the viscid secretion of the bronchial muccus membrane. In a state of evaporation, as described in a former essay, it may be inhaled. The inhalation of other agents which have been recommended as expectorams may at the same time exhibit their germicidal action,-the vapors of beazol, of carbolic acid, and of cresolin; the reputation obtained by gas-works in the treatment of schoopingcough is thus readily explained.

The effect attributed to astringents in the treatment of whoopingcough is best explained by their action on the mucous membranes. Particularly altim and tannin have been so employed. Emetics have been recommended for the purpose of relieving the surfaces of sticky mucus difficult to renove. Copper or zinc sulphate, powdered specae, and importh mineral are the proper substances to be selected for that purpose.

Schliep has seen good effects of the use of the preumatic chamber in whooping-cough. He kept the children with their mothers or attendants in compressed air. In some cases a few sessions of two hours each were sufficient to relieve the patients considerably. In a number of cases from twelve to twenty sessions were required. In all of them he claims decided effects, not only in the reduction of the number and severity of the attacks, but also in the deration of the disease. The explanation of the good effects is looked for as well in the increased amount of oxygen inhaled as in the diminution of the hyperaemia of the mucous membrane. I believe that the plan is a good out, particularly if it can be combined with the inhalation of turpentine.

Caillé (Arch. Ped., August, 1892) says that ozone inhalations have a very distinct curative effect as regards the duration and severity of the disease.

Cases exhibiting a severe degree of pharyngitis and laryngeal hyperæmia, particularly in children who have suffered a long time from chronic inflammatory affections of these parts, will do well, so far as the local symptoms are concerned, under the use of the tinceure of pimpinella spectraga; half a draclim (2.0), mixed with water and glycerin, distributed over the twenty-four hours will be the proper those for a child of from two to three years.

Local treatment has been resorted to by many. The pharynx has been treated locally with a solution of quinine (Hagenbach), a two per-cent solution of resorcin (Moncoevo), a one-per-cuille solution of merguric bichloride, a one- or two-per-cent, solution of silver nitrate, a fire-per-cent, solution of cocaine hydrochlorate, or a four- or sixper-cent, solution of potassium beomide. Applications of quinine mixed with sodium hicarbonate in different proportions, of mild solutions of salicylic acid, and of powdered selpher have also been made directly to the larvax. Inhalations of sulphurous acid have been resorted to, besides those enumerated above, and extelled as highly as any which have been mentioned. If they prove anything, they and the great number of remedica recommended for the same purpose show the difficulty encountered in the treatment of whoosingcough, and the confidence of the practitioner in the patience and submission of his wards. Michael treats whooping-cough as a neurosis, with the same means he employs against other neurosesattributable (or attributed) to usual irritation. He asserts that seventy-five per cent, of his cases of arbopting-cough have done well when exposed to the influence of quining, potassium bromide, benzel, tannin, boracic acid, salievlic acid, iodoform, cocaine, sodium hicarbonate, or prepared chalk applied to the mucous membrane of the nares.

The internal administration of chloral hydrate, or croton chloral hydrate, was recommended by Lorey in 1870. The daily doses ranged from eight to fifteen grains (0.5 to 1.0). In all cases the attacks became less severe within a short time, but the disease itself was not shortened. Kennedy expresses himself very enthusiantically in regard to the effect of the remedy, which is given by itself or combined with potassium bromide. To procure an occasional good right, a single dose of from six to twelve (0.4 to 0.75) grains has reinfered me good service.

Rest and sleep should be enforced. W. W. Johnston's (Arch. Ped., April, 1895) advice to keep children with whooping-rough in bed is good. In that way isolation, rest, and equable temperature are secured, and the results of the feebleness and dilatation of the heart are avoided.

The inhalation of chloroform or, according to some, of ether can

be recommended in those cases in which convulsions have either occurred during severe attacks, or in which the interruption of the circulation is such that cerebral honorrhage or convulsions are to be feared. In the case of a very young infant I have administered chloroform regularly for every new attack during the course of a number of days in succession for that very purpose, with beneficial result. Bromodom was recommended by Stepp, in three or four daily doses of from one to four drops, to be given in sweetened water or in murilage,

Oninine has been used both internally and externally by a number of authors of good repute. It was first recommended by Binz. Rossbuch credits the drug with the power of relieving increased reflex irritability: Binz, however, attributes to it an anticymotic action. He gives as many decigrammes daily as the child has years, so that a child of five years takes eight grains of quinine a day. He expects to find an improvement after two or three days, manmeh as the attacks are said to become by that time shorter and less severe. When it cannot be given internally, he administers it in suppositories or in injections. When the sulphate or hydrochlorate is not tolerated, the neutral quinine tannate is selected instead, with this proviso, however, that, the latter salt being much weaker than the former, it must be administered in doses from two to three times as large. It has the advantage of being tasteless. In our own country it is particularly Forchheimer who advocates quinine. He reported ninety-seven cases as having been benefited by its administration. Enquining may take the place of quimme in the same doses.

Antipyrin has been recommended for whooping-cough, since 1880, by Dennith, Somenberger, Moncorvo, Giraita, Wendt, and many others, as almost a specific. Like all the other chemical relatives of chinolin, it destroys parasites outside the organism. It has been claimed, or presumed to display the same effect internally. Whether that is true remains to be seen. At all events, it is a powerful nervine. It is asserted that it can be given with the same beneficial result in the beginning of the disease and in its most severe stage, and that the latter will terminate favorably in from four to five weeks after the beginning of the treatment. The dose is from a grain and a half to two grains (0.1 to 0.125) three or four times a day for every year of the patient, with an occasional large dose for the night.

Tussol, the amygdalate of antipyrin, is given in the same doses as antipyrin. As H. Rehn recommends it quite highly, it should be tried. It must not be given in nulls, nor in close proximity to it.

Of all the almost countless medicines advised against whoopingcough I prize belladonna most highly. I have always returned to it since 1801, when I published my experience with it (classe, Med. Monthly), after having discontinued it for the purpose of trying one after the other of the many remedies recommended during these fortyone years.

The result obtained by me has generally been this; that a well-developed case of whooping-cough, after the diagnosis was made certain, would last for only three or five works longer, instead of running through its full course of months and quarters of a year. The effect is mostly not a endden one. Many cases in which belladiona is given from the commencement may become worse for a short time, then remain at their height for some days or a week, and gradually improve in both the character and frequency of the attacks. In others the effect is perceptible from the first days after its administration, the cases soon assuming a more favorable aspect.

Infants of six or eight months of age affected with whoopingcough require a sixth of a grain (0.01) of either the root or the alcoholic extract three times a day; children of three or four years tolerate three doses, each of half a grain (0.03). These doses appear to be very large in proportion to those tolerated by adults, but it is a fact which can easily be verified, that the effect of belladowns on the pupil and heain is hardly ever perceptible in children from these or smaller doses. The succession of belladonna symptoms in children differs, moreover, altogether from that in adults; the erythematous and flushed appearance of the face and neck, sometimes even of the whole surface, is the first symptom in infantile age; whereas it is seldom observed in adults, or in cases of thorough poisoning only. Some of the old authors advised the administration of belladoena to such an extent as to produce the first symptoms of poisoning; others, however, objected to this practice as dangerous. I, for my part, soon found that those children suffering from whooping-cough who exhibited general erythema from an apparent overdose recovered soon. while others, in whom no such symptom was observed, remained sick for a long time; and continued experience has proved that the occurrence of this symptom is absolutely necessary for the full rentedial effect. To obtain control of whooping-cough, the remedy must be given in a dose sufficient to produce erythema, or at least a flushed condition of the face, and, as it were, feverish appearance after every dose of belloforms. Thus the dose is to be gradually increased until this result is obtained. It is a remarkable fact that very young itfants may take proportionately large doses; at all events, I do not

remember a single case in which less than half a grain was taken in the course of a day. The prescriptions I have been in the habit of ordering are very simple coses. I either give the medicament as a powder, or have the extract dissolved and sweetened according to circumstances, or give it as a powder mixed with sugar of milk.

The administration of belladonna alone is indicated in such cases of whooping-cough as are not complicated with inflammatory affections of the respiratory organs. The latter take the lead in complicated cases as well in treatment as in the nature and gravity of the symptoms. This is so certain that, whenever a paramonia coincides with or follows whooping-cough, the peculiar sound of the cough of the latter will disappear, and return only when the inflammation begins to subside. As this is, moreover, the more dangerous of the two, it requires attention before the other. As to bronchial and laryngeal catarrh, the former especially is a very common symptom in whooping-cough. When it is slight, it may be considered as unimportant; when, however, it gives rise to fever or dysproxa, it constitutes a further indication to interfere.

The preparations mentioned above need not be the only ones to be relied on. The tincture of belladonna is a convenient remedy, inasmuch as the dose can be readily and gradually increased. A baby of two years may take three daily doses, the first of which may be six drops. If the flush be perceptible within twenty or thirty minutes, that is the dose; if not, the number of drops must be increased to obtain the effect which is demanded after every dose. After a few days larger doses are required; there is no case but demands at least twice the amount of the original dose of belladonna within ten or twelve days, or before the disease disappears. Atropine sulphate may take the place of belladonna. A child of two years will probably begin with the five-hundredth of a grain, to be given three times daily, and increased according to the rules stated above.

Opinm is spoken of favorably by a great many. I cannot reconmend it for anything like regular administration, but it certainly has a good effect in procuring fair nights when given in a single dose. A grain of Dover's powder given to a child of two years, at bedtime, will, at all events, have the result of procuring sleep. In a number of cases the combination of opium and belladonna acts quite well. The antagonistic action claimed for these two drugs is not such as to interfere with their sedative properties.

It is self-understood that the treatment is the same in those cases of pertussis in which the characteristic cough is less murked than attacks of speeging or suffocation by spasm of the glottis.

VI

Diseases of the Nervous System

1 General Indications.

THE great indication in the treatment of all diseases of the nervous system attended by symptoms of irritation is absolute protection against external disturbances. This is attained by equable climate. uniform temperature of the room, rest in bed, exclusion of light and noise, comfortably wann clothing, warm bathing, warm applications and fomentations, and by the removal of anything and everything annoying and jarring. Therefore, children sick with nervous diseases must not be excited by unnecessary constraint or coercion, their medicines ought to be given in a palatable form, and vesicatories and other distressing applications avoided, if possible. Symptomatic treatment is perhaps more indicated than in the same class of ailments among adults. Pain and sleeplessness lead to speedy exhaustion. Nothing is more common and more dangerous than the prejudiced refusal to relieve pain by opintes and sleepleisness by properly relected hypnotics. It is particularly in those cases which are mostly, or entirely, of a reflex nature that a symptomatic treatment ought to accompany that of the causal indications. It is Indicrous as well as criminal to withheld chloroform when an eclamptic attack results from an intestinal irritation, or an antisposmodic when a cough is caused by stomach, ear, or nose. A convension may at any minute came apopiexy, paralysis, idiocy, or epilepsy.

Many symptoms may be relieved by the position of the head when they point either to hypersemia or to assemia of the cranial contents. The former is benefited by a position approaching the vertical, the latter is relieved by a horizontal one. Not infrequently the former requires derivants (purgatives) and cold, the latter stimulants and warm applications.

In conditions of depression, debility, and paralysis the treatment should be stimulant, exciting, and roborant. In such cases the electric current is frequently employed, and is, to a certain extent, useful. Massage has a beneficial effect not only on the periphery, but by its general action on innervation and circulation, by its effect on the muscles, and also be its direct influence in increasing the relative cirentation of the red blood-cells (John K. Mitchell). Strychmac stimulates (while curare depresses) the reflex and vasomotor centres Silver nitrate appears to exert a favorable influence in spinal paralysis; muscarine, physostigmine, and nicotine in paralytic conditions of the matriped muscular fibres.

The interrupted electrical (faradic) current is an excitant-stimulant-of the persons system, both locally and generally. For the latter effect general faradization has been practised, both through large electrodes and in the bath, to great advantage, according to many who have a right to claim a large experience. The generally stimulant effect does not, however, disprove the fact that, like the galvanic, the faradic both is capable, particularly when the fine wire coil is used, of reducing undue sensitiveness. The action of the galvanic current is believed to show itself in different ways. It is stimulant and excitant, and (directly, or when interrupted by reversing), mainly when the brush is employed, produces pain, contraction, and consecutive dilatation of blood-vessels. It is electro-tonic, and thereby produces changes in the irritability of the tissues; it is chemical, and thereby decomposes fluids; and it is cataphoric, and thereby transfers solutions through budly conducting tissues. To the two poles different properties are attributed. It is the positive pole (anode) which is credited with a tranquillizing effect in inflammations and penralgias (less in tie and hemicrania than in supeaorbital, occipital, interecetal, lumbar, and sciatic neuralgias); the negative (cathode) is known to influence old inflammatory processes, cicatrices, and influrations. Still, there is no doubt in my mind as to the exaggerated character of the expectations once cherished in regard to the effects to be obtained

^{*}General massage (with dry hands) of the whole node body, of excremities, neck, and trank, lasting from fifteen to thirty minutes, is indicated in assemble chlorous, redious contalescence, chronic rheumation, and neurasthesia. To reach the muscles some force should be used, but no violence, which is liable to came capillary hemorrhages. Acute pain, local inflammations, and the presence of pen are contraindications. I have seen a good many cases of a rhronic or an undiscovered peritoritis approvated into an acute attack by teckless munipulation. Unless the physician has full control over the doings of a professional majorar and ample confidence in his skill, he should do the manage branch or employ a professional min who has selected missage as a specialis. The proulation of blood and lymph is best stimulated by massage of the whole length of the muscles. The lymph-ducts run along the intrafficillar corrective many. By compressing and emptying them and the blood-vessels from the peripheral ends in the direction of the centre of circulation a new supply is furnished and the general nutration improved. Locally it acts well in recent injuries, contutions, and discortions, in subscrate and chronic inflammations of joints, in newmore contractures arthritis deformant, and arthritic mescular atrophy (18offa)

by both electricity and galvanism. The difficulty of reaching a covcted spot through tissues of different conducting powers is always. great; the accumulation of fat is a powerful obstacle to the traismission of the current, and its amount cannot be calculated. This is so true that even for purposes of diagnosis the subcutaneous fat of babies and of many women offers a serious impediment. Besides, different morbid conditions and different periods of life interfere with the estimation of the effect of the current. In what has been called the reaction of degeneration both the faradic and the galvanic irritability of the nerves are diminished, and while the galvanic excitability of the muscles is preserved, the excitability by the farafic current is lowered. In the very young,-the haby mider six weeks,as general reflex irritability is quite low," comparatively strong electrical influences are required to obtain effects. At all events, the action of the different currents is, to some extent, not measurable, controllable, or certain. The time during which both the faradic and the galvanic currents were considered far-reaching and omnipotent remedies has long gone by. Indeed, there are those, particularly among neurological specialists, who, while maintaining that the currents are great aids for diagnostic purposes, set reject their claims as curative agents. Years ago Meltzer-in a paper read before the Association of American Physicians-proved the total absence of effieacy on the part of the electrical current when applied to the mucous membrane of the stomach and the intestines.

Franklinism, once the only recognized electrical remedy, has rapidly regained a standing among electrical methods. But neither the common disruptive discharges used in locomotor ataxia nor W. J. Morton's "static induced currents," obtained by adding condensers to the static machine, will find many applications among children affected with diseases of the nervous system.

The effect of the electrical and the galvanic currents is perhaps best exhibited in cases of peripheral nervous affections. Paralysis of the facial nervo and of the brackial planus, both not infrequent after difficult or clumsy, rarely after easy, deliveries, when the female pelvis is narrow, the shoulders of the fortus large, or the head deflected, are among those in which the current is frequently used; its effect is mostly very slow, sometimes not very satisfactory. Par-

[&]quot;According to Sulmann and many followers, the invintility of perigheral nerves is small in the newly-horn; it increases until he is also wells sld; at that time it equals that of the adult. The atmendix reaction is thow, like that of a fatigued unimal.

ticularly in cases of facial paralysis in which the reaction of degeneration has already been established it leaves much to be desired. The paralysis of the brachial plexess of the newly-born, as it depends on stretching, laceration, or henorrhage, and is sometimes complicated with injuries to one or more of the joints of the upper extremity, -in the lower joints the affection is rarely observed,-allows a doubtful prognosis only. It concerns mostly the fifth, sixth, and seventh lower cervical nerves, which form the posterior cords of the brachial plexus. In that case the deltoid, biceps, brachialis internus, toracobrachialis, infraspinatus, and sometimes the exterior muscles of the hand are affected. When the lesion is deep-seated the whole extremity is paralyzed and will be shortened and atrophic. Some of the cases, however, are distinctly the results of an interstitial inflammation and consecutive hyperplasia of the connective tissue of the nerve-fibres. In such, no matter whether on the book of sophilis or not, the interstitial hypertrophy should be fought with mercurials or lodides, or both. The same must be said of polynowikis, such as follows infectious diseases, with its pain and increasing paralysis and degeneration, together with intact bladder and pupils, -in which rest, sodium salicylate, and, later, arsenic and stryclinine yield better results than does the current. Nor is it more effective in hemicrania, no matter whether it be the result of congenital disposition, or complicated with hysteria and epilepsy, or dependent on anemia, hypermetropia, dispensia, overwork, or confined air. In all these conditions the correction of the causes, a convex glass, country air, shortening of school hours, cold-water treatment, arsenic, iron, and aconitine, with an occasional dose of a bromide, will yield better results.

To complete what I have to say on the subject of the remedial influence of electricity and galvanism, I may as well speak here of their employment in the peculiar changes of the muscles which are known under the headings of muscular atrophy, progressive jurvaille muscular dystrophy, and pseudo-hypertrophy. All of these names are applied to abnormal conditions whose course automical changes are better understood than their causes. So long as these are unknown we cannot help admitting that therapentical experiments, such as those with thymus gland in pseudo-hypertrophy, be they ever so tentative, are justified. In a certain percentage, indeed in the vast majority (exactly as in Thomseu's congenital myotomia), the alteration is in the beginning strictly local or confined to muscular tissue; in others there can hardly be a doubt as to the cerebral origin of the muscular anomaly. In all of them electricity and galvanism have been extensively used, together with massage, bathing, etc., but in

no case have their effects been noteworthy. The best results have been obtained through systematic exercise and training of the muscles. As in many other cases in which the original cause (or change?) is inflammatory, and exhibits itself in proliferation of cellular interstitial tissue (no matter what its final result is destined to be), mercary, mostly the bichloride,—administered patiently and watched carefully,—appears to have given me better results. At least, the progress seemed to be slower and intermissions of the morbid process more distinct and prolonged.

z. Operations.

Operations on the skull and brain are attioug the prides of modern operative surgery. Escapes from death on the table are more numerone than formerly, and recoveries from diseases formerly fatal, because permitted to die without an operation, are not unleard of Cramotomy has been performed for injuries, intra- and extra-dural hemorrhages, hydrocephalus, softening, tumors and cysts, Jacksonian epilepsy, athetosis, chronic contractures, certain mental diseases, otherwise inervable headaches, old cicatrices, and abscesses. Infinits and children come in for their share, mainly with abscesses, hemorrhages, budrocephalus, Jacksonian epilepsy, and premature ossilication of the cramial bones and fontanelles, with epilepsy and idiocy among as results. So far as craniotomy and craniectomy ary concerned in eases of wicrosephalus or idiacy, no other surgeon has met with the favorable results alleged to have been obtained by Lannelongue Guided by thirty-three cases of American surgeons,-fourteen of which died soon, while nineteen only recovered from the operation, and very few showed any improvement,-I treated of the subject in my address before the Eleventh International Medical Congress at Rome, April, 1894," and arrived at the following concurious: that congenital idiocs is the result of must different forms of arrest of development (of blood-vessels, correx, (sland of Rell, hemispheres). of inflammations (meninges, encephalon, with softening or selerosis). of thrombods, and of henorrhage; that it is a frequent result of microcephalus, which, as a rule, is not dependent on premature ossification of the bones and fontanelles, but in the large majority of cases on arrest of development of some parts of the brain, mostly connected with long-continued patency of the fontanelles; that, therefore, operations undertaken to widen the cranial cavity are of no use, for a brain which did not grow before the cranium closed will

[&]quot; "Non mocere," New York Medical Record, May 15, 1854.

not grow afterwards, and absent or defective parts will not develop: that even cases with a clear history of premature ossification are not, or very doubtfully, benefited; that, finally, the operation undertaken for the surpose of enlarging the cranial cavity has the opposite effect, as is proved by the experience of Van der Veer and Hum, also by a case reported and drawn by Bourneville, and, finally, by the skull, belonging to B. Sachs, of a child operated upon twice in the course of sixty-seven days by A. Gerster. It exhibits a mass of hard tissue proliferating into the cranial cavity along the whole wound made in the first operation. I trust, therefore, that the days of uncalled-for craniotomy and craniectomy are numbered. Bourneville (Prog. Mid., (897, p. 390) favors emniectomy for bliney in cases of trauma, abscess, or tumor only. W. W. Keen (Janr, Nervous and Mental Dir., February, (8)8) reported eighteen cases of children, from twelve months to six and a half years old. Five died of the operation, six were slightly improved. His contraindications are: a fair-sized head, microcephalus, or age beyond seven years.

Starr collected, in 1889, a total of 270 brain famors in children. Of these 152 were tuberdes, 37 gliomata, 34 sarcomata, 5 gliosarcomuta, to echinococci, eysticerci, and cysts, 10 carcinomata, and 2 gum-The carcinomata were mostly secondary, the gliomata and sarcomata primary. Forty of the two hundred and seventy were superficial, and in sixteen of the forty their localities could be distinctly diagnosticated. Therefore, trephining and operations on the substance of the brain for tumors will never be numerous. Their diagnosis is not always easily made, and that of the locality affected is beset, for the present, with still more difficulty. Gliomata are rarely near the surface; solitary tubercles are sometimes found in the gray substance of the brain, but more frequently in the corporastriata or thalassi optici. In many more instances an operation will be required because of tumors originating in the cranium or its periosteron and encroaching upon the brain; they are mostly surcomata, fibro-sarcomata, or osteomata. One of the last mentioned I have removed. A cost of the dara mater, resulting from hemotrhage, was successfully removed in the service of Dr. Henry Hun, at Albany, followed by marked improvement of the child's idiocy and convulsibility.

Starr is rather favorably inclined towards trepanation in a number of cerebral diseases; it is true that those which promise no success from medical treatment cannot lose by surgical interference. In such cases of hemorrhage as permit of a localized diagnosis, though that between an extra- and an intradural situation may be impossible in many instances, he favors in. His advice of tentative interference with "microcephalus" I do not look upon favorably. Absterna, unless they be the results of pulmonary gaugene, typhoid fewer, or pyennia,—if their location can be determined and is accessible,—are to be operated upon; the opening must be sufficiently large to permit of examination, and draining should be both extensive and prolonged until granulation and complete recovery take place. Tumors are not often the subjects of operation in children. It is true that many are met with in infancy and childhood; according to Gowers, two-thirds of all the cases of intracranial tumors occur in the first two decades of life. But those occurring in early life are mostly found in the cerebellum, the hasal gauglia, capsula interna, corpora quadrigorina, pedanculi, pons, and medulta oblongata, rarely in the fourth centricle; very few such will ever be accessible to an operation.

No case of obscure brain disease, and no suspicion of brain tumor, should be dismissed without the consideration of the possibility of its applicable origin. Gummata will occur, endarteritis is frequent. In these cases mercury and iodides, internally and subcutaneously, in ample doses, and continued a long time, are in order. Otherwise, nothing is left but symptomatic treatment: morphine, hytocine, chloral, bromides, purgatives, hot foot-baths. Lumbar punctures appear to do no good; indeed, have done harm and resulted in sudden death when made in the presence of brain tumor.

3. Inflammatory and Erudative Processes. Arrests of Development.

The simplest form of cerebral meningitis is that which results from insolation and mental emotions and exertions. Frights (especially protracted fears) and overstudy are frequent causes. So is trauma. which, however, is Eable to produce the purnlent form. In pocumonia, particularly of the upper lobes, it is not uncommon; less frequent in typhoid fever, more so in the septic diseases of the newlyborn, where, however, it is liable to form part of the general pyemic condition. With the exception of the latter, in which death is certain, an antiplilogistic course of treatment is indicated here, if anywhere The hair should be cropped short; the head most rest on a cool pillow and be placed high. Calonel at first in purgative, later in smaller doses. As the mercurial treatment is to be continued, a solution of potassic chlorate may be applied frequently to the gums and mouth The heat of the head and the local inflammation must be fought by cautious cold applications, according to the directions given formerly (p. qg), and by leedus applied to the masal septum or to the mistold processes, also by emping to the neck and shoulders; come by cold affinious to the head god hot bathing, with or without mustard, of the rest of the body. Great restleaness, deepleaness, and general excitability demand warm bathing, bromides in generous doses, from one to ten grammes (lifteen to one hundred and fifty grains) a day, chloral, and codeine. After the first invasion and the period of high fever have been successfully dealt with by calonel and a few large, afterwards moderate, doses of digitalis, the time for potassium iodide (from one to five grammes daily) has arrived, also for vesicatories to the neck and behind the cars. In regard to the latter, however, it is always well to be careful, for cautharides are the sworn enemies of the kidneys. The iodides must be continued a long time. Of the roborants to be given during convalencence, iron ought to be the last one selected. Lumbar puncture will be discussed shortly.

It is not always easy to diagnosticate between a fully-developed meningitis and a hyperannia resulting from similar causes,-viz., overexertion, emotion, insolation, and the continued effect of overheating and stimulating diet. The continuation of the treatment depends on the persistence of the symptoms. Onite frequently a warm or hot mustard-bath, with temporary applications of ice to the head, repeated hot foot-baths, sinanisms to the neck, an erect posture in bed, a calonel purgative (with or without local depletion), and occasional counter-irritation by derivant enemata (vinegar one, water five to six) will suffice. The Austive hyperconic, however, complicated with and depending on general and local cereival marinia (occasionally even throulous of small vessels) and that which is caused by the rapid inamition produced by the different forms of acute and exhausting intestinal discharges require an altogether different treatment. In place of the antiphlogistic treatment, stimulation is indicated. Still. caffrine and alcohol are to be avoided during the worst stage; camphor, ammonium carbonate, and musk will answer better. Food and medicines are to be regulated by the requirements of follicular or other enteritis, and water must be supplied in ample quantities. When however, there is vomiting and when diarrhora is persistent, neither the storrach nor the rectum will accept it. In these cases the only salvation may be in copious (pint or quart) subcutaneous infusions of warm and sterilized salt water solution (water one thousand, table salt six to seven, with or without sodium carbonate ten to twelve).

Throughout from other causes are treated on the same principles. Debility and paralysis require such stimulants and irritarts as the brain will tolerate. Eucholius, with their secondary conditions of irritation and inflammation, should be treated according to the rules detailed above, and will require ice, purgatives, warm bothing, and solides, with or without bromides. The resultant paralysis demands massage, electricity, strychnine, and mineral testles such as St. Catherine or Kreuznich. Chronic remnants of an inflammatory disorder, so matter from what cause, may be benefited, even after a long time by a protracted course of treatment with potassium iodide, or with mercurials, or both together, or alternating.

Ergot is useless in these cases of intracranial hyperamia; in does not have the favorable effect which often follows its use in similar changes in the spinol canol.

Policoscrypholinis is either foetal, or congenital, or postnatal. Its results are cysts, cicatrices, softening, atrophy, scierosis, or porescophalia; its causes, sickness or syphilis of the prognant mother; in the child, usually from one to four years old, syphilis or infectious diseases, such as influence, measles, or scarlatine; its symptoms, hemiplegic (sometimes diplegic or paraplegic) paralysis with secondary contractures, more of the apper than the losser extremities, increased reflexes, and milateral atrophy of the maxillar, forchead, or face. The acute attack requires rest, ice to the head, leeching, caloniel, perhaps chloral hydrate and chloroform; the chronic condition, mercurials and iodides, massage, passive and active exercise, orthopodic treatment, inclusive of tenotomy; and those cases which result in infocy or epilepsy, careful training and treatment in proper institutions.

In connection with this spanic heaviplegia should be mentioned congruital spasic muscular contraction (Little's disease). It is the result either of a fortal arrest of development or of inflammation, possibly sometimes commacted iluring a protracted labor. The lower extremities suffer more than the upper, sometimes immediately after birth; they rotate inward; the body, hips, and knees are stiff; the walk is optimis; the sphincters always, intelligence sometimes, intact; the muscles not bard during rest, but stiffened when being used. Improvement is possible, but only with persistent and patient exercise and training and absorbent treatment.

Tubercular ateningitis is not always fatal, though the diagnosis permit of no doubt. The latter, however, is mostly made at an advanced stage when the prognosis is already very ominous. Bieders had an opportunity to make an autopsy on a patient treated for tubercular meningitis, death resulting from another disease. He found old meningeal tubercles. Still, many of the recoveries reported—mainly for the purpose of proving the efficacy of specific treatments (tarter emetic and isodoform ointments and those more modern)—are of doubtful character. I have also seen recoveries from what I diag-

nosticated as tubercular meningitis. One died afterwards of necrosis of the cranial bones, occasioned by my tartar emetic ointment. Another case, that recovered thirty years ago, is still alive in an insane asylum; he has never been normal, mentally, since I discharged him "cured." From what little I have said it is evident that a preventive treatment only may be expected to do good, if anything will. Infants and children of scrofnlous or tuberculous families should be brought up with unusual care, mornly when there was (or ix) a case of tubercular meningitis in the family. Congestion of the brain, caused by feather pillows, exposure to the sun, hot rooms, roffee, ira, and alcohol, or physical and mental overexertion, must be guarded against. Trauma may become the proximate cause; infectious fevers. such as measles, influenza, and pneumonia, also whooping-cough, require great care. Constipution must be overcome. Eczema and other eruptions of the surface should be slowly healed, but they must be healed. Their presence is a constant source of danger, both by reason of the opportunities afforded for a direct invasion of microbes and of the irritation and swelling of neighboring lymph-bodies. These, when found, must be removed by internal treatment, massage, ointments (green soap, iodide-lanolin mixtures), or enucleation. Nasal catarrh should immediately be relieved; adenoid growths in the nasopharynx either regularly irrigated or, when they are large, removed. Their persistence is a cause of "scrofulous glands" and, possibly, of secondary informulosis; also of direct invasion of germs through the patent orifices of the lymph-vessels at the base of the cramium and the extradural tione. The best general preventive treatment of infants and children with a predisposition to tubercular meningitis. rendered probable by bereditary taint and by suspicious symptoms. consists, in my opinion, in the regulation of the diet and bygione: animal food mostly, daily cool or cold bathing with vigorous friction, open windows, exercise, cod-liver oil during the cool and cold months. arsenic in regular small doses, and pure guaiacol (or guaiacol carbonate) for many months in succession through a course of years, besides attention to the nares and adenoid growths.

When the disease is fully recognized, constitution must be overcome; the first drug to be used for that purpose should be, or contain, calomel. It may be repeated from time to time, provided the regular use of potassium isolide does not contraindicate it for chemical reasons. The latter ought to be given in large doses through (nearly) the whole duration of the illness. Tubercular meningitis both permits and demands large doses,—from one to three drachms (five to twelve grammes) daily. Moreony is indicated. Calomel and potassium todale being incompatible, the highloride should be given, or mercurial sentments used instead. Capliac stimulants may be employed to advantage from the beginning, the circulation being defective on account of the undue irritation of the pneumogastric nerve. Strophanthus (and strychnine in very small doses) appears to act better than digitalis. Caffeine and alcohol must be carefully avoided. Chlorad will not well when headache is severe and a tendency to conrulsions exhibits itself. To combat the latter the inhalation of chloroform cannot be avoided; nor asyrphine altogether, when the pain is excessive. Antipyretics are not indicated in the beginning, when the temperature is low, except in the infant, with its tendency to high temperatures in the beginning; during the last few days, when, in the vast majority of cases occurring between the second and seventh years of life, it rises previous to death, they are meless. With natur emetic continents applied on the closely shaved head I have had ample experience, and shall not employ them again. My experience with sodoform ointments (1 to 5 or 10) is but small, and my confidence in their efficacy still smaller. Vesicatories may do larm by amoving and irritating the patients; I expect more derivative action Iron keeping the lowels open and the body sufficiently covered with clothing. Loeches are seldom useful, except when conjunctival injection and local heat of the head become apparent at an early date. Otherwise, symptomatic treatment is all that can be advised. Unusually severe vomiting in the beginning may require ice pills and mild doss. of an opiate, or cocaine, perhaps tincture of todine in one-quarterto one-half-drop doses, or arsenous acid, one-three-hundredth to one-five-hundredth grain (one-fifth to one-eighth milligramme), from four to ten times a day. Ice applications are useless, for the tenperature is low before the last stage sets in, the local hyperannia mostly passive, and the tolerance of ice in small children easily exhausted.

To what extent the operative treatment by trephining and drainage will prove successful remains to be seen. There are but few cases of tubercular meningitis not complicated with general miliary tuberculosis; thus the prognosis of operative interference is not at all promising. Besides, the cranial cannot be compared with the pertoneal cavity, which is believed to be favorably influenced by the pertormance of a laparotomy. Peritonical tuberculosis is very upt to be isolated and uncomplicated, its scereting surface of a different character, and drainage easier. Still, trephining and drainage have been performed. Sins committed asseptically are readily forgives. Since Quincke (1891), lumbar puncture, mostly between the third and fourth lumbar vertebrar, has resulted in facilitating a diagnosis in many in stances and in temporarily relieving some symptoms,—those of congestion, ordenia, pressure, coma,—but rarely aided in accomplishing a cure.

In order to obtain any cerebro-spinal liquor from the cranial cavity, lumbor punerure should withdraw from ten to fifteen cubic centimetres. The total amount should not often exceed twenty or thirty at any one time. None may be obtained when the needle does not reach the spiral canal, or is obstructed by filtrin, or is caught between the nerve-fibres of the canda equina, or when the connection between the ventricles and the cerebral and spinal subarachnoid spaces has been disturbed by exudative processes. The normal liquor, also that obtained in many pathological conditions, is clear, of 1007 specific gravity, and contains from 0.2 to 0.5 per mille albumin. One per mille albumin in the flind means information. Sugar is sometimes found in connection with tumors. In simple serous mennights, in chronic hydrocephalus, in that connected with purumonia and other infectious diseases, also with uncomplicated tumors, the liquor is clear, in cerebro-spinal meningitis it is enrhid, somewhat purnlent, and contains pnermococci and meningococci, in many cases (by no means all) of abscess and of cerebro-spinal meningitis pus and streptococciand staphylococci, in tubercular meningitis mostly bacilli, in apoplexies and hemorrhagic pachymeningitis blood. Kiliani and G. W. Jacoby found blood when the diagnosis of spinal hemorrhage had been made.

Puneture, which should never amount to an aspiration because of the pain in back, head, and neck which is caused by it (Fürleinger). not always successful even as a means of diagnosis, has not set given much satisfaction from the view of therapeutics. It gives some relief in meningitis, headaches (inclusive of the headache of chlorosis). Helirium, and hyperaesthesia, but these symptoms are liable to return. I am, however, so certain of having interrupted the course of cerebral inflammations and improved their sympoms temporarily, that I trust I shall see recoveries like those that have been obtained during the last few years. (Cerebro-spinal meningitis, Kohts, Netter.) In a few cases of cerebral lead symptoms, and in those connected with chlorosis, it is said to have given relief. Lenhartz improved a case of cerebral cedema connected with tranmatic injury. H. Barth reported lately a case of telerentar meningitis (diagnosis by lumbar puncture) which recovered. The patient was two and three-quarters years old. Eight looches in eight days. Altogether, it is to be hoped that we are standing in the restibule of a new therapeutical achievement.

General paresis ("periencephalitis" and other changes; in a case

of John Thomson and D. A. Welsh—Br. Med Jour., April 1, 1899 atrophied frontal and parietal convolutions, patches of congestion and induration in the white substance, dilutation of the fourth ventricle, and granulating ependymitis of the lateral and fourth ventricles) forms no exception to the rule that the pathological changes occurring in the brains of adults are also found in children. Paresis is, however, rare. In a few cases there seemed to be an hereditary disposition as in other cerebral alterations leading to chronic intellectual disorders. The vast majority of cases are of syphilitic origin, and a thorough antisyphilitic treatment ought to result bevorably now and then.

The prognosis in, and the results of treatment of, chronic kydrocrokalar depend on its nature. When it is congenital, no matter whether internal or external, whether the result of a fortal inflammation (of brain-substance, meninges, plexus, or ependyma of veraricles), or of obstruction by a tumor, or of an arrest of development, the morbid processes leading to it are so serious as to render the outcome of treatment-though it do not prove fatal-very problemutic. Substantial changes of the original brain-substance cannot be remedied by the removal of fluid. Nor is it probable, or rather possible, that the cerebral atrophy produced by permanent impacerebral pressure can be overcome by attempts at relieving hydrocephalus. The chances are better when chronic hydrocephalus is the result of a postnatal meningitis occurring after trauma, whooping-cough, or acute infections. But even in these cases, while the recoveries-I mean anatomical recoveries-from the secondary effusion are more numerous, the inflammatory alterations both in meninges and brain are such as either to predispose to future meningitis or to as after both the physical and mental functions of the crarial contents as to render the result either very doubtful or far from desirable. Our prisons and lumatic and adiot asylums tell the tales. The chances of hydrocephalic patients are best when the disease is the result of chronic hypersemia,-for instance, in craniotabes. Such children, with a slight amount of hydrocephalic effusion resulting from the hyperzemia of rhachitis, are always apt to get entirely well under proper antirhachitical treatment (fresh air, animal food, phosphorus, iron, etc.), and even large amounts of fluids are absorbable, with restitution of the brain and its functions, in a certain percentage of CESES:

After all, it is evident that iodides, mercurials, vesicatories, disphoretics, discretics, and purgatives are useless in congenital hydrocephalus. In the other forms the diagnostic and therapeutical skill of the practitioner will make the required selection, so far as indicated. Should the head grow rapidly, the prognosis is had. In these cases even compression will do but little, mannuch as compression of the increasing fluid, unless it can be removed, will also compress the brain. In less progressive cases the application of rubber bundages or caps, also adhesive straps round and over the shaved skull, may do some good. They should not be omitted in those cases which are being punctured, provided the cranium is still compressible. Indeed, in almost all the cases on which it was performed the children were quite young and no ossification of the sutures had taken place. Therefore, the case successfully operated upon by Relm, of Frankfort, Germany (with repeated punctures),-that of a girl of twelve years, presented (alive) before the German Congress for Internal Medicine of 1886,-may be considered very exceptional. Cases which require trephining before drainage can be established hold out no hope, hecause the skull and brain cannot close in upon the emptied cavity.

Punctures of the hydrocephalic cranium were made in antiquity, but, like many other experiences of Hippocrates, were forgotten. It was not until this century that observations of recoveries were made after the intracranial fluids had found a spontaneous or traumatic outlet. Hoffing published a case (1828) of recovery from hydrocephalus after a complicated fracture of the frontal bones and a discharge extending over days; Greatgood (1828) one after an injury produced by a nail; Hasse (1818) one of spontaneous perforation. Huggenin collected six cases of recovery after a discharge through the nose (or ear) had been established. Punctures have been made in great numbers; many more, certainly, than have reached the eyes of the medical public. It can, however, easily be understood that very probably not a single case of recovery has taken place that has not been published. Indeed, the publications were mostly made very soon-too soon-after the operation or operations were performed. Thus, when Berly collected twenty-seven cases of recovery after paneture (two of which were combined with tincture of iodine injections), he expressly stated that only eight of them had been under observation a year or more. Altogether, it may be more himson than, unfortunately, scientific to pride oneself on one's results, particularly when these results boost of benefit to mankind. Thus, Conquest reports "ten cures" out of nineteen cases operated upon by himself. Charles West, than whom there was no critic more learned, wise, and incorruptible, collected sixty-five cases with (alleged) "sixteen recoveries," which he however, reduced to three or perhaps five. Battersby came to the conclusion that probably there was one recovery

in fourteen cases on which the operation was performed. But from my previous remarks, referring to the severity of the original lesion and to the results of the fluid present either outside or inside the brain, it is easily understood that I cannot look upon the result of the operation as anything libe so favorable as is claimed. Still there are many cases in which (when they are postnatal) it must not be omitted, together with general treatment. I have made a number of lumbar punctures for the same purpose, with visible effects on the distended fouranelles and sutures, but without a cure, and have come to the conclusion from a good many cases that if a puncture is to be made without the injection of iodine, the lumbar puncture should be preferred. It can be repeated as often as the cramial puncture, with very much less danger of consecutive oozing. Among the remedies I value most highly here, or wherever tissue-building is a main object, is phosphorus. It may be alternated or combined with iodides, digitalis, iron, or arsenic, according to circumstances; also with antisyphilitic treatment in all cases in which, from conplicating symptoms or the history of the father (or family), herefatary syphilis with its vascular degenerations can be presumed to be the cause of the hydrocenhalic effusion.

The cranial puncture should be made over the large formatelle, about one centimetre or more (half an inch) from the median line; vertical when the lateral ventricle is to be reached, oblique when the hydrocephalus is external. It is best not to remore much finid the first time: from twenty to twenty-five cubic centimetres (five to six drachms) will suffice. As a rule, there is but little reaction, and the operation may be repeated within a few days or a week. During the operation and after it compression must be made to prevent byperaemia, hemorrhage, and rapid re-effusion. In cases of external hydrocephalus a mild injection of iodine with potassium iodide and water ("Lugol"), or Morton's fluid (consisting of sodine one part, potassium iodide three parts, glycerin forty-eight parts), may be made to suppress secretion. It will take very numerous observations, however, during many future years to determine to what extent all these attempts at suppressing secretion and at facilitating meningeal adhesions and reproduction of brain are to be considered valuable in the interest of families or of markind in general. When the percentage of albumin contained in the aspirated fluid increases after every operation, the prognosis is bad.

N. M. Hunter, of Union Springs, Alabama, published in Poliatrice, August 15, 1902, the report of an operation on internal hydrocephalus which proved successful and looks very promising. By the closing of the foramen of Magendie and all channels connecting the ventricles and the subarachnoid and subderal spaces, brought about by pressure from within and original lesions, the pia and dura were found dry. Now his operation consists in the introduction of one or more strands of fine catgot into each of the ventricles, landing them in the subdural space, and closing the dura and the external daps. In this way the absorption of the fluid in the subdural sac and a complete recovery were accomplished. This operation will naturally be more appropriate and radically helpful observer the brain has not suffered too much by pressure and atrophy. Postnatal hydrooophalus offers a better prognosis than the focal form.

A number of chronic degenerations of the brain, both general and local, are the result of inflammatory processes. If they be prenatal, the prognosis is very bad: if acquired after both, the nearer the beginning of the treatment to their starting the better the possible result. Such conditions are disseminated sclerosis, with its increasing bodily and mental failure, nystagmus, and death under the symptoms of deep sopor, also the congenital form of infantile spartic hemiplegia. Little's disease (p. 276), infantile spartic hemiplegia depending on collegencephalitis, and butter pavelesis. The general indications for treatment are the same. In acute exacerbations, depletion, ice, and laxatives will be required. Buffer perolymit, acute cases of which I have seen twice as the result of hemorrhage, with ptosis, accelerated pulse, rapidly increasing facial paralysis, also paralysis of extremities and of respiration, until death closed the scene within a day, may often demand a local application of ice to the mape of the neck. The chronic condition, with fibrillar twitchings, electrical changes, and absence of reflexes, requires the different forms of electrical and galvanic treatment, isdides, mercurials, and warm bothing. In all such cases the indications are pronounced enough, but the results mostly negative. It is only chronic cases that permit the treatment. with iodides and moreury. Syphilis should never be lost sight of as a possible cause.

Meningocole (a hernial sac with liquid contents only) and encephalocole (hernia of the brain-substance) are but rarely amenable to a successful treatment. When they are small, the protrading contents may be retained by a properly fitting appliance of lead or leather or rubber, until the absormal aperture has had time to close. This process may be accelerated by the administration of phosphorus (of phosphoratum or elixit phosphori) in three daily doses of onefourth of a milligramme each (one-three-hundredth grain). When larger and irreducible, the timefaction has been caught in a clamp and punctured, or removed altogether. In some cases the clamp was allowed to remain, in others it was removed; in the latter the wound was sutured. Modern surgical journals report favorable cases of operations performed not only on meningocele, but also on uncephalocele. The complication with hydrocephalus impairs the prognosis. Similar treatment has been resorted to in a few cases of meningorele aparia, which results under an intact scalp from fissures of the cramum to which in infancy the sura mater is tightly adherent, induced by for ceps operation, by fall or some other trauma, by caries, or by apphilis.

There are complications of a grave nature. When the brain is injured down to a lateral ventricle the gap may become permanent and cause porencephalia. Rhachitis and the interposition of brainenhetance between the fractured bone prevent spontaneous recovery. Indeed, it appears that the fracture never heals spontaneously; practically, the fissure may close by the interposition of the thickenol membranes and aponeurosis, together with diminution of the cerebrospinal liquor. Such an apparent recovery may, however, not always be a blessing, for epilepsy and metastatic meningitis have been observed afterwards. Recent cases may be treated by the elevation of depressed bone and hone suture. In incipient spontaneous improvement (in fact, in stationary cases also) the tumefaction should be protected by a pad. Todine injections have been made into the cavity, which contains cerebro-spinal liquor only, with occasional success; and in a few cases of epilepsy and of rhachitical hydrocephalus, complicating the condition, the lateral ventricles were drained.

4. Psychical Diseases.

Psychical diseases have been believed to be rare in infants and children. The statistics published by limatic asylums and by special ists are meant to prove that. These statistics are correct, but the conclusions drawn from them are not. Every practitioner knows better. Suicide is on the increase. Dementia and mania are by no means rare at any period of infancy and childhood; suchnecolia, often without delusions and with suicidal tendency, and similar conditions of depression are not quite so frequent; they are more generally found before and about puberty. The public institutions do not contain such patients. A perverse, demented, or even manifical child is managed and prevented from doing harm to itself or to others, at home and by the family, better than an adult, and it is there that numbers of such patients can be observed. The same forms of mental disease occurring in the adult are seen in the young. Besides those which have been mentioned, we meet with moral manify (often characterized merely

as motor and psychical restlessness, or incorrigible conduct), monomania, epileptic and circular dementia, even paresis and delirium fremess. More frequent than either or all of them are idiocy and crytinizm, the former of which is a not rare termination of mental. anomaly in the adult, while in the young it is among the first appearances of aberration, though, indeed, but the result of ever so many different anatomical changes. Here also heredity is one of the factors. A peculiar form of amaurotic family idiocy, almost exclusively observed in Hebrew families (thus far mostly Russian), always fatal, and associated with a characteristic condition of the macula lutes. terminating in optic atrophy, with early blindness, was described by Tay and B. Sachs. Some varieties I have discussed above, also the possibilities of treating them medicinally or by surgical procedures (p. 272). Cretinism has some well-understood anatomical peculiarities or causes; prominent among them are the shortening of the eranial base by premature ossification of the occipito-sphenoidal synchondrosis and (it appears principally) the absence or degeneration of the thyvoid gland. Thus, the cretinism of the focus and infant and the mexordema of the adult are among the results of the same anomaly.

My object in enumerating most of the possible causes of mental disorders in the young is principally to show that the preventive treatment should be considered more reliable than the curative. Heredity plays an important elife, so does inebriety and all other forms of psychical alterration or serious nervous disorders of parents; for instance, epilepsy, diabetes. To what extent matrimony between relatires contributes to mental disease in the offspring is by no means proven. I cannot, from theoretical reasoning and from practical experience, admit that two healthy persons, be they ever so nearly related, will for that reason have a diseased child. But to what extent the state of the future will interfere with the marriages of insane and epileptic people, as also with those of carcinomatous or inherenious patients, provided our therapeutics continues to be as meatisfactory as hitherto, remains to be seen. It is natural, however, that the rapid favorable changes of the last few years in our therapenties, both internal and external, should increase our hopes in regard to great results:

Diseases of the forms, mostly of inflammatory character,—meningitis, encephalitis, chronic hydrocephalus, eclampsia,—predispose to mental disorders. So does syphilis of the brain. During birth, prolonged labor or undue pressure by pelvis or forceps invites hemoerhage with its results. Spontaneous hemorrhages are the more common and the more dangerous the younger the infant. Congestious

and inflammation of the meninges or of the brain are frequent in the infant and child. Their causes are rhachitis of the cranium, insolation hot stoven and bed-pillows, tumors, stimulants, such as correct tea, and alcohol, falls and blows, congenital or acquired diseases of the beam, and microbic infections. Disorders of the ears are frequent, and affections of the toos not unbeard-of causes of intracranial disease. Infections diseases, such as typhoid, scarlating, crysipelas, rheumatism, influence, are known to be direct causes of mental disturbance in the young. The removal of intestinal worms has ended a psychical disorder. I have known overesertion at school to result in mental aberration, which terminated either in recovery or in death from exhaustion or maningitis. The period of puberty, with its andden changes, creates a predisposition, and excessive masturbation may cause decangement. Bad habits, had training, and congenital migraine add oil to the fire.

This cursory emmeration of causes gives plenty of food for thought. The conscientious family physician with a rember of infants and children under his charge has a great responsibility. His cares ought to begin with conception. Many a case of infant meningsta-(hydrocephalus) can be prevented by timely attention to the amenic or syphilizic pregnant mother. Labor must not be permitted to last too long; asphyxia in the newly-horn must be immediately attended to, and strict care should be taken of the diet and hygiene of the bahy, Errors in this respect are not punished immediately: and though some habies thrive, or appear to thrive, while mistakes are being constantly made, in others the foundations are being slowly laid for ill health and serious disease, both physical and mental. That heart and ears ought to be attended to in time, and persistently, is self-understood; but procrastination-waiting for better times and "second dentition" and "puberty"-is too common an occurrence. Perhaps the greatest negligence on the part of medical men is exhibited in regard to mental overwork. Our schools have become bot-houses in which scoliosis, near-sightedness, amemia, neurasthenia, chlorosis, and cerebral exhaustion and disease are being beed in incredible numbers. If the children are sent to school at six or seven years of age, it should not be for gotten that their brains cannot endure constant work without exhaustice and injury. Between the sixth and ninth years persistent exertion, the teaching unit, should not last more than twents or twenty-free minutes of every hour, between the ninth and twelfth years thirty or thirty-five, after the twelfth year forty minutes. For the first class two or three, for the second three or four, for the third four or five hours are all that should be enforced. Short learning units

permit carnest work and progress, long ones came drudging labor and dangerous latigue. The apparent offset to this mental overwork—gymmostic for "calisthene" exercise in the same huilding, as part of the carriculum—adds to the general exhaustion. It is time that the medical profession looked into the mercasing degeneration of the people resulting from this overstraining of the young brain, ninety per cent, of the growth of which is not attained until the seventh year, and the full growth not reached before the fourteenth or seventeenth. Physicians should no longer be afraid of the charge of going into politics. If they do not wish to be "politicians," let them be something better,—statesmen.

The general remarks made on the first pages of this article will suffice for both the general and causal treatment. Serious and immanageable cases belong to an institution. Conditions of excitement, besides proper hygienic and dictoric treatment, require rest in bed, warm hathing (not hot), and plenty of sleep, which may safely be procured by opiates (extractum opis, codeine), or hyoscine, chloral, sulphonal, amylene hydrate, notwithstanding the reports of individual cases of overdoses or idiosyntrasies.

In the treatment of psychical disorders it is easy to do too little or too much. As long as our huntic asylums are (were?) only more or less genteel prisons, and wherever the "superintendents" are custodians rather than physicians, where records are kept slovenly, and no autopoles made, nothing whatever is (was?) done to relieve the physical basis of intellectual disorders. Whenever that is sought for, and found with more or less certainty, the indications for treatment are self-evident. Overdoing, however, is as bad as underdoing. Hypnotism should not play a prominent part in the therapeutics of the nervous system. Its utility is doubtful and its dangers as great as those connected with all sorts of psychological experiments generally. Autoseggestion is very active in neurasthenic and hysterical persons, also in the soung, who, when approaching puberty, even when in average health, are imaginative, unreasoning, credulous, and impulsive (Hurd).

Mild forms of temporary mental aberration are the night-terrors (purer nectureus). They are mostly (not always) met with in delicate, pule, serofulous, or rhachitical children, with neuropathic tendencies somewhere in the family. Like attacks of genuine dementia or mania, they are not remembered by the patients. But few of them are attended by fever; many result from or are connected with digestive disorders, masal polypi, admoid growths, hypertrophied tonsils, and other causes of dyspnera like asthms or rheumatic endocarditis.

These should be attended to. Heavy meals must be avoided, also emotions, frights, ghost-stories, and exciting games; the attacks are often connected with reminiscences. The bowels should be kept relaxed. A dose of quinine or potassium bromide at bodtime and a well-aired and cool bedroom, not absolutely dark, are good preventives.

3. Spinal Inflammations and Arrests of Development.

The general rules for the treatment of diseases of the organcontained in the spinal canal are almost identical with these detailed in reference to the brain and meninges. With the exception of rare cases of pseudoplasm, the changes occurring in the spinal cord and its meninges depend on anomalies of the circulation, or on some form of inflammatory process, either in an acute or a chronic state. To the latter class belong the final and persistent lesions of apinal pachymeningitis and leptomeningitis, transverse myelitis, poliomyelitis, sportic spinot pavalusis (the spinal form of what was described as cerebral spastic humiplegia), lateral and annyotrophic lateral scleroria, paramyoclomic and takes (hereditary or acquired). Multiple discensinated scleroits. with its, at first, slight tremor in voluntary movements, which may be the only symptom for years, and is followed by nystagmus, optic atrophy, scanning speech, and tendon-jerks, appears to me montly localized in the spinal cord in children. Before entering upon a course of treatment, it is of the greatest importance to study the stickers of an instridual case; a disease of the bone, or inherculosis, or synthis must be known before it can be effectually treated. The latter is very frequent, in the newly-born also, with supination of forearms or complete paralysis of one or both upper extremities or of the mustles of the neck. Nor is it superfluous to omit the exact diagnosis of those ailments which are at present supposed to be of an infectious rature and of bacteric origin, such as Landry's paralysis and policityslifer: for the time may come, even during our lives, when an extensive anti-infectious, antibacteric, antitoxic treatment or preventive immunization will be among the modern therapeuties of many apparently immanageable diseases. Even ecute sayolitis, though many casuare directly connected (in the adult) with alcohol or sobacco, is orrtainly dependent on gonorrhom, syphilis, tuberculosis, and the acute (mostly streptococcic) diseases such as angina or influenza and typhoid fever. Some are hemorrhagic, with a tendency to spread upward or laterally,

In every case of acute disease of the spinal cord or its meninges (hemorrhage, hypercenia, spinal meningitis) absolute rest is required. But the patient, to avoid overheating and hypostasis, must not be kept on his back constantly or most of the time, and not on feather-beds or pollows. Quilts covered with linen or cotton sleets, air-mattresses, or water-heds are often absolute necessities. When the acute disease can be localized, as mostly it can, cold water, ice-water, the ice-bag, with now and then an other spray, or local depletion by cups or leeches is indicated. Vesicatories or the fineture of sodine ought to be avoided in this stage because of their irritating and annoying effects. Purgatives are required on general principles,-calomel (and) or salines. Now and then a mustard both, quite hot, will act well as a derivant. The indications for digitalis (or other heart regulators and invigorators) are frequent; direct antipyretics are seldom required. Ominine acts better here than in diseases of the brain, in which it appears to give rise to occasional congestions. To influence the spinal circulation in acuse and subacute diseases, ergot (useless in cerebral diseases) holds a high rank; the fluid extract may be given in doses amounting for the day to from one to eight or ten grammes in the beginning, later less, according to age. Its indication does not cease until the stage of chronicity, with amemia, contraction, and incipient atrophy of the blood-vessels. Potassium iodide is indicated early on account of its influence on the circulation, and later for its absorbent effect. The difficulty in handling very old cases is due to the permanency of the local lesions which result from the solidification and eleatrization of the new cell profilerations. Nor are the difficulties in this respect any less, with the exception of some syphilitic cases, in regard to mercury. The somer and the more persistently these remedies are employed, either internally or externally, either simultaneously or alternatively, the better will be their gradual effect. The bugbear of salivation is no beiger feared since it has become more widely known that the younger the patient the better will be bear mercury. Galvanism and the electromagnetic current are used on general principles, as mentioned above. Neither should be employed at an early stage. The former requires large electrodes, well salted, to reach the cord; the direction of the current does not appear to make much, if any, difference. Sessions of from six to ten minutes, the current being inverted once or twice during that time, once or twice daily, are all that is demanded. The interrupted current is employed later to stimulate the muscular action, and should be used locally with small or more generally with large electrodes, or in the bath. Amesthesia may require the application of the metal brush. Warm butking is often attended by very good effects, due to its influence on circulation and the surface temperature. A both may last minutes or hours; the latter mainly in secondary contractures, which may also require tenotomies. In those cases hot sandbaths have been used extensively in Europe, particularly where the fear of water has not yet begun to want from the minds of the masses. Their meditiness consists mainly in the invariability of their temperature, which requires less attention and watching than a warm-water bath. In chronic cases oluments have been extensively used. Still, very few substances can be rubbed through the epidermis and cutis; indeed, hardly any except potassium isolide (in glycerin, better still in lanolin) and mercury (ointment and oleate). Their application to the spinal column is of no advantage; it is better to select the usual places where the skin is thin and the lymphatics are near and numerous,—viz., the inner aspect of the extremities. Over the spine the actual cautery has also been found beneficial, together with the mineral springs containing salts and iodine (St. Catherine, Kreuznach, Deynhausen, Numbeim).

In many, both of the acute and the chronic cases, a symptomatic treatment cannot be avoided. Pain must be fulled. Now and ther the anode (positive vole) of a mild galvanic current will have some such effect; sometimes the local application of chloroform ointmentor chloroform vapor in cotton, an ether spray, a menthol stick, or menthol in a ten-per-cent, alcoholic solution will do good. If not, have seine, chloral hydrate, croton chloral hydrate, opiates (internally or subcutaneously), or hot fomentations are required; for there is no greater enemy of the sick than pain, and no greater bliss and gain than rest. Other symptomatic treatment may be required for the motors and trophic paralyses resulting from a number of spinal-cord diseases, such as paralysis of the bladder, of the intestines, of the splineters, and bed-sores. The latter are very ominous, and the ointments of hismath, or tannin, or balsam of Peru, or Juchsin 1, landin 80, vaseling 20, though they be indicated and locally useful, will not defer very long the final termination. Paralysis of the hladder is said to be benefited by local internal electrization; it is benefited by ice-cold injections: its secondary cystitis is certainly improved by plain of nedcated warm irrigation. Paralytic constipation requires physostiguts. massage, and regular enemata. All of these forms of chronic paralysis will be more benefited by the subcataneous than by the internal administration of strychnine sulphate.

Suspension has been practised for several years in some of the chronic diseases of the spinal cord, mainly in takes, which, fortmately, is rare among children. That find may again become fashionable in another generation. Operative stretching of nerves is occasionally useful in contractivest depending on cicatrimation, as also in some pentalgias of adults.

While the symptoms of tabes dorsails in children are rather identical with those observed in the adult (ataxia appears late, often after fisorders of the bladder, absence of patellar reflex, and paresthesia have existed for some time), haveditary ataxia (of Friedrich, a crenbined disease of the gray and white substances of the posterior and lateral cords) differs in this, that it may be seen in several members of the same family, has no defects of sensation, vision, and sphincters, and rarely of intelligence, and that ataxia of the lower and very soon afterwards of the upper extremities is an early symptom-Antisyphilitic treatment, galvanism, hydrotherapy, massage, and persistent active and passive exercise should be reflect on.

Acute poliomyclitic (spinal essential, "dental" (1), infannic paralysis), as the initial stage may differ both in its onset and in its symptoms, may require different measures at first. Some cases exhibit a high fever, great excitement and prostration, even cerebral symptoms. The majority, however, come on suddenly, without fever and without premonitory symptoms. These differences become explainable by the differences of ctiological findings. The causative atrophy of the ganglia of the anterior horns is not primary, but in the first instance the result of vascular inflammation with proliferation of round cells and hemorrhages. All of these are, however, secondary and of an infectious nature like that of multiple neuritis. No specific bacteria have been found, but meningococcus and other coeri, a large spicen. hemorrhages on the pleura, swelled intestinal follicles and Pever's playnes, proving infectious character, and complications with pneumonia, enteritis, polyneuritis, rheumatism, endocarditis, abscess of the knee, and angina. W. Pasteur observed seven children in one family within ten days; all of them lad fewer and beseloche, three paralytic symptoms, two transitory disturbances of nerve equilibrium, one typical poliomyelitis, one more cerchral, the others more peripheral symptoms, one angina. Endemics and epidemics have been described in fair numbers, leaving no doubt as to the infectious nature of the disease. According to Axel Johannessen (Festschrift in honor of Abraham Jacobi, 1900), Colmer (Amer. Jour. Med. Sci., 1843) reported a case of paralysis in a baby of one year which he observed in 1841 in the parish of West Feliciana, Louisiana. The parents told him of eight or ten other cases of the same disease that had occurred within a few miles during the last three or four months. The former class requires antinyreties and the necessary attention to cerebral and Wher urgest symptoms; much more can hardly be done, because in treat gases of this class the diagnosis will probably not be made at first, with the exception of those in which it is assured by local pain

and paralysis. These latter are the cases in which local applications of ice may prove beneficial.

Every case, whether feverish or afebrile, requires absolute rest. The few which are suspected of originating in theumatism, or those which are complicated with peripheral neuritis, should be treated by salicylates, and locally by warm applications or fomentations. All the rest will do better with cold applications-ice-water, ice-lag, cold water-continued for some time, but with interruptions. Depletion by means of leeches or by emping is often indicated, particularly in such cases as exhibit local pain. I feel certain that a purgative in the beginning (calomel, salines) will do good; so will ergot; the equivalent of from one to three grammes or more may be given daily, either as extract of ergot or as fluid extract of ergot. It may be accompanied by a few drops of the tincture of belladonna. As early as possible-that is, as soon as the necessity of absolute rest will permit of inunctions being made-mercurial olittment (on the first day or days the cleate) may be used, and the internal administration of potassium iodids commenced at once. Both may be continuedparticularly the latter-for several weeks; the dose should be smaller than in cerebral meningitis, from half a gramme to one gramme daily being sufficient. Tincture of iodine modified by the addition of alcobol, or sinapisms frequently applied for a few minutes at a time, may he used with advantage.

The rapid improvement during the first week after the ouset of the disease, and the slow convalescence of the few months before the residual (mostle local) paralysis becomes final, having been estallished, the indications for treatment will change. Congestion and dilatation of blood-vessels are followed by aniemia and contraction, and in place of belladonna and ergot, streelmine must be given; at first, perhaps, internally. It may be beneficial when so administered, but hypodermically it will act better. I cannot agree with Gowers, who asserts that it is probably "never either necessary or desirable to give it by hypothermic injection in this disease." On the contrary, many cases that had been treated with strecknine internally for months to me purpose gradually improved to a certain extent under daily, or three weekly, subernaneous injections of from one to two milligrammes of strychnine sulphate. Still, a complete recovery I never saw. Several times a day, for weeks in succession, the cold shower-both applied one or two minutes to the back, followed by lively friction, will contribute to the stimulation of the spinal circulation.

The rapid waste of the paralyzed seaseles requires local stimulation. Frictions with oil vaseline alcohol and water, tepid water, or bot water must be employed several times a day. When the surface circulation is still fair, cold water may be preferable. Passive movement must take the place of active exercise when the latter is impossible. The farable current will stimulate and may improve whatever there is left of contractility. Should it become totally inactive, the reversed galvanic current may take its place for the purpose of exercising the muscles. Otherwise the galvanic continuous current is emisently the nerve and blood-vessel stimulant, and must be used daily to keep up the circulation and thereby the nutrition of the degenerating tissues. It is best applied through large electrodes, and should be made to ascend and descend alternatively. Sessions of from six to ten minutes, one or two every day, are sufficient, but they must be continued a long time. I know that limbs which had remained unchanged in their atrophy and uselessness for years improved under patient galvanic handling, when persisted in for a long time.

Mechanical appliances will prove useful. The arm must be so supported as to render the slipping out of the socket of the paralyzed humerus an impossibility. The rare cases of dorsal paralysis require a jacket or a properly fitting corset. The paralyzed (mostly extensor) muscles of the lower extremities demand elastic hands, so as to counteract the contraction of the antagonistic flexors and thus to facilitate walking. Meanwhile the remedial agents mentioned before must be continued. Strychnine will always do good, and phosphorus will act both as a nerve stimulant and as a tissue-builder. It may be given to a child a year old in doses of from half a milligramme (half a teaspoonial of the citizer of phosphorus of the United States Pharmacopoxia) to three-fourths of a milligramme daily. To expect an improvement of notrition by ligating the paralyzed limb is a grave mistake. That procedure will tunnefy, but not nourish, the constricted part.

Consecutive club-foot requires the employment of proper orthopædic apparatuses at as early a time as is judicious, to prevent an timecossary degree of anemia, atrophy, and shortening. To avoid the necessity of such mechanical aids, operations are performed, which will be discussed in Chapter XIII.

Circumcision has been performed on children affected with poliomyelitis, without any justification either in theory or in practice.

The varieties of hydrorrhachia (spina hi6da) depend on the more or less extensive arrests of development and their secondary changes. Like the differences between meningocele and encephalocele on the head of the newly-born, we must discriminate between a meningocele and a myelocele over the lower part of the nervous centre. The treatment, which should not be commenced until the diagnosis from dermoid or from teratoma is assured, differs accordingly. In more advanced years I have seen spinze bifidae, in the lumber and in the cervical regions, whose connection with the spinal ranal, originally narrow, was totally obstructed, so that their removal caused no difficulty whatever. Cases accompanied by mulformations, contractness, or paralyses of the lower extremities do not respond favorably to treatment. Those rare ones which are complicated with superjacent tumors (mostly lipomata) or with hypertrichosis (very rare) must be carefully watched, for careless operations on what was considered incomplicated pseudoplasms have proved fatal. Such as are of central origin,-myelocele,-in which accordingly the posterior columns with the nerve-roots spread over the interior of the suc, give a grave prognosis. Spontaneous hursting of the sac must be guarded against, for much loss of cerebro-spinal liquor is apt to terminate fatally in a very short time. Puncture may be resorted to and repeated, a face needle being used. After each puncture pressure ought to be applied to prevent rapid filling up. A few cases-mull ones of simple meningoode -have been known to get well in this way. Or, after the puncture, iodine may be injected. Morton's formula-iodine a part, potassic folide 3 parts, and giveerin 48 parts-has been very felicitons in his hands and in mise. Favorable cases have been successfully treated by the clamp, suturing, and gentle compression, and had cases by extirpation of the sac and utilization of the periosteum of the patient. Robson transplanted that of a rubbit in 1883. Modern surgery has been fairly successful in a number of cases. Even paralysis was claimed to be no contraindication, for it was believed to be sometimes. the result of pressure by liquid only. I never saw such a case. But as had cases of spina bifida are sometimes complicated with other anatomical lesions, asymmetry of the body, stigmata of ears and texth, besides the local hypertrichosis alluded to above, the difficulties grow in proportion.

6. The Nerves.

Neurins may be continuicated from inflammations of the neighboring tissues, but most cases occurring in infancy and childhood are the degenerative processes of peripheral nerves in infections diseases, mostly in diphtheria, but also in scarlatina, typhoid, measles, etc. Polyacuritis itself sometimes assumes the character of an infections fever, with enlarged spleen, nephritis, and high temperatures. Absolute rest in bod, warm formulations and prolonged baths, sodium salicylate in daily doses of from ten to thirty grains (0.6 to 2.0), arsenic in different forms (Fowler's solution one to five drops daily). antipyrin, eldoral hydrate at bedtime, the galvanic current, and roborant diet without stimulants are indicated. Neuritis resulting in or complicated with entaneous eruptions will be discussed in Chapter XI.

Neurowata (neuro-thromata) are, it appears, always congenital, in many cases heredinary, mostly numerous, now and then painless, but sometimes very painful. They belong to the same class with entaneous thromata, plexiform neuromata, certain forms of elephantiasis, and certain pigment new). The treatment should be directed against the pain. The only radical cure is by extirpation (W. W. Keen and William G. Spiller in Festschrift).

Peripheral paralysis is not infrequently noticed in a facial nerve, narely from rheumatic or central causes; often as the result of ofitis, caries of the petrous bone, parotitis, or extensive lymphadenitis. The former requires sodium salicylate, antipyrin; rarely pilocarpine, which is not well borne by the young, and should be given in emergencies only; the latter has a doubtful, sometimes a had, prognosis, and requires the treatment of the cause. I once saw paralysis of the serratus muscle after a severe strain in whooping-cough, evidently the result of a lesion of the long thoracic nerve.

7. Neuroses of Central or Local Origin.

The treatment of colombia depends on its etiology. Repeated attacks may be the results of identical causes,-for instance, feverishness, insestinal disturbances, and emotions,-but they suggest the existence of epilepsy. Indeed, a single eclamptic attack cannot be distinguished from an isolated epileptic science. According to the various causes to which eclamptic convulsions may be due, the best preventives are regulation of the diet and of the bowels; the removal of worms and lice; the withholding of alcohol, of the mile of an alcobolic mother, coffee, tea, and improper foods; and the watching of every kind of fever, from a simple catarris to an inflammatory or infectious disease. In households where there are babies known to be subject to eclampsia the clinical thermometer is indispensable. Catarrial fever, intermittent fever, pneumonia, otitis, meningitis, and acute eruptive diseases are often ushered in by a convulsion. Tight bandaging, renal calculus, and splinters in the skin are to be suspected. when no other cause is readily found. A normal dentition never produces a convulsion, and "difficult dentition" as a cause of a convulsion is among the affections which are as rare as they are too readily diagnosticated.* The habit of lancing the gums (with its

^{*}See my Destition and its Desargements, New York, 1862.

bad influence on gums and treth, and the possibility of microbic invasion), to which many practitioners are still addicted, proves the frequent absence of diagnoses and the readiness with which tribute is paid to the prejudices of past centuries and to those of the female population. Cranial and encephalic rhuchitis, with or without laryngumus stridulus, is often attended by convulsions, and requires antirhachitical treatment.

The habit of regularly administering bromides to infants who have convulsions is a bad one. As a regular medication they ought to be reserved for epilepsy. The attack demands the removal of the cause. Irrigation of the stomach, or an emetic; irrigation of the howels with water, scop and water, oil, turpentine, assaintida; a purgative (calonel with or without an antifermentative, such as resorem or salol, followed or not by castor oil); the proper use of a warm both; a cold pack frequently repeated, with ice to the head and heat to the feet; the timely administration-in an argent case antipyrin under the skin-of an antipyretic: chloral hydrate internally or by the rectum; inhalations of chloroform to shorten the attack,--all suggest themselves as most promising in certain cases. Chloroform ought not to be emitted, for at any moment a violent convulsion may occasion a cerebral hemorrhage with its dire effects on life, or holy, or mind. Sinapisms to the neck and to the extremities have often been recommended, but, besides the possible after-effect of annoying and arritating the infant suffering from a Vidnerable nervous system, they cannot be expected to have much or sufficient derivative action. To quiet the irritability persisting after an attack, chloral hydrate with or without a bromide, or repeated small doses of codeine or extract of opism, or the campborated fincture of opism may be administered.

The causes of alterna minor—St. Vitus's dance—are either amounted changes (some of them improvable, some incurable) or functional disturbances; perhaps also microhic toxins. Dubler and Meyer found a staphylococcus which Maragliano claims as pyogenes, Pianese a bacillus. That may explain its occurrence after scarlatina, measles, or influenza not complicated with rheumatism, and the frequent coincidence or complication of chorea with rheumatism. These two have often been taken to be coordinate effects of the same cause (toxic). This much is certain, that while rheumatic fever is often followed by chorea minor, the latter sometimes precedes the former by days. Therefore the treatment should vary according to the etiology, but hardly a case will do well without attention to the functional treatment. Indeed, some forms of the latter are almost of a specific character. Prevention is indicated when the patient is of a neurotic constitution; the

descendant of a neurotic family; when suffering from digestive or genito-urinary disorders (masturbation); when accustomed to alcohol in more than medicinal doses; or when he has rheumatism or heart. disease: Capillary embolisms and hemorrhages, cysts, intercles, and exudative changes in the nerve centres, particularly the brain, also in the anterior horns of the cord and the commissures, also in the white smistance generally, are not subject to preventive measures. The same holds good in any cerebral lesion located near the pyramidal tracts,viz., in the cortex, in the internal capsule, or in the basal ganglia. Denune observed a case depending on a fissure of the anus; it admitted of direct treatment; Soltmann a chorea of the left side after traumatic depression of the right parietal bone; others report cases depending on shrinking cicatrices and on neuritis. I have observed a marked case of acute chorea which was caused by spiral meningitis of the cervical portion. In this case ice, local depletion, purgatives, and ergot were the successful remedies. (Segnin's "Clinical Lectures," vol. i., 1872; second lecture.) In the American Journal of the Medical Sciences, April, (886, and in the "Festschrift zum 50sten Geburtstag von Professor Hesoch," Berlin, 1890, I published observations of partly local, partly general chorea which depended on misal reflexes due to catarrhal and inflammatory changes and to polypi. The symptoms were mainly facial grimmers, winking, drawing the mouth to one side, and shrugging the shoulders. They are identical with what has been described as "Italiet spasm" by Mitchell and Osler (4th ed., p. 1088), or "tic," the worst instances of which have been observed as peculiar forms of sudden muscular contractures, jumping, germflexion, stooping, etc. In all these cases the treatment and cure of diseases of the nose and nasopharyngeal cavity are demanded preliminarily to the successful treatment of St. Vitus's dance.

When heart disease or a tendency to acute articular rheumatism is the cause, preventives share largely in the success of the treatment. The hygiene must be strict and medicinal attention to the cardiac ailment close. The rheumatic child must be anxiously watched; pain, he it ever so alight, requires rest in hed for one or two slays at least and tentative doses of sodium salicylate. Helminthes must be expelled.

Neurotic children, frequently with nrine that contains phosphates in large quantities and has a specific gravity exhibiting the widest differences, should not be overworked; the school sessions must be short. Gool or cold washes, with friction, and systematic, but simple and brief, gymnustics in the open air, not in a close school-room, will strengthen them. The period of convalencence from any incidental discase must be passed in bed, which should be placed, if possible, mar an open window. America must be carefully watched and treated. The patient should not be allowed intercourse with neurotic, or hysterical, or choreic, or epileptic, or even merely violent children; for some of the worst cases of chorea are those produced by fright. Headaches of a simply neuralgic or ocular origin must be attended to; the latter neurlly require glasses, sometimes the protracted use of strychnine, but no mustirected and unauthorized operations when there is no disturbance of muscular accommodation; in the former aconitine will often prove helpful.

A patient sick with chorea minor must be kept quiet in body and mind, particularly when the case is a relapse, or caused by instanton. Bad cases will not get well, unless confined to bed in a quiet room, with no visitors or excitement, with but a single person present to entertain or read to them, with a warm, protracted both daily, and with ample sleep. Very bad cases must be kept sleeping eighteen out of twenty-four hours by means of mild opiates or chloral hydrate with or without bromides. Sometimes large doses are necessary, but the effect must be obtained. I have met with cases in which an occasional inhalation of chloroform was also required. Meanwhile, the symptomatic measures adapted to the average case should be attended to.

The best symptomatic remedy is arsenic, in the form of liquor potassii arsenitis or sodii arsenatis. Three doses are to be given daily, much diluted, after meals. When the eyes or the intestines login to give trouble, or when a serious entancous eruption makes its appearance, or should the urine show albumin and casts, it is time to internit The doses must be increased slowly but persistently, according to the rule detailed on page 120. The original dose can be doubled or quadrupled; indeed, can be increased almost indefinitely. The cause of tailure on the part of arsenic is generally its insufficient dose. Monitormated camplior in daily doses of from four to ten grains (0.25 to 0.0) will act well when arsenic cannot be, or is not, given. Aspiru appears to have good effects in three daily doses of from eight to fifteen grains (0.5 to 1.0), when given uninterruptedly for weeks, or with occasional interruptions. Antipyrin is successful in many cases.

Of other remedies, alver nitrate may be mentioned; it is of less service here than in some other adments of the nervous system. Zine soide or zine valerianeste may be tried, if arsenic happen to be omitted. The galvanic current, warmly recommended by Benedict, has not satisfied me. Sulphur bathing, either natural or artificial. is adapted to cases consequent on rhemnatism; it is indicated as after-treatment, as are also rational gymnastics and general roboration."

Tetrary means tonic puroxysmal (for minutes or days) flexions of the carpal joint, the thamb turned into the hand, the fingers adjacent to one another (obstetrical hand), also stiffness of neck, frequently equinus position of foot, with increased (motory and galvanie rather than sensitive and faradic) electrical irritability (Erb), with attacks caused by compression of vasomotor-brachial physics and below the knee (Trousseau), and mostly also spasm of upper lip and alse wasi through pressure below the ayecmatic arch in front of the ramus mandibularis (Chyostok). It has been observed in different disturbances of the general health, after gastro-intestinal disorders and during the presence of worms, in convalescence from acute and chronic (perticularly infectious) diseases, after sudden exposures to changing temperatures, in chronic malaria, after injuries to the head, as the result of emotional irritation, or as a consequence of the abuse of alcohol. The fact of the occurrence of tetany after total extirpation of the thyroid gland may lead in future to a correct diagnosts of many cases of tetany in children and to a regular, accurate examination of the thyroid gland. It is sometimes absent, or hypertrophied, or in an abnormal condition. The majority of cases are connected with thachitis, mostly with its cranial (and encephalic) variety and its laryngismus stridulus. It is often found during cold springs, endemically, sometimes epidemically. The several causes emmerated above explain the occasional difficulty of a satisfactory etiological diagnosis. but suggest the preventive and curative treatment. Pilocarpine has been mentioned as the successful remody in a case which was probably caused by exposure. Gastro-intestinal disturbances (with cewithout autoinfection, accompanied by fever and by indican or acetone in the urine) demand proper medicinal and hygienic treatment, occasional purgatives, and intestinal antisepsis with resorcin, naphtalin, or salol. Tetany after infectious diseases and during convalescence generally requires rest in bed, good air, copious (perhaps forcible) alimentation, and roborants. A very solid galvanic current, prolonged warm (not hot) bathing, bromides, chloral at night, and small doses of codeine in older children will be required according to

[&]quot;Huntingden's calored, a chronic meningo-excephalitis with atrophy of corrolations (first described in Philad. Rep., 1872) is an hereditary chronic progressive process not observed in children, which is histic to terminate in demonia after many years. It is characterized by incoordinate movements of the hands, face, and, gradually, also of the lower extremities.

the severity of the cases; they will get well after weeks or months. A volorant and antirhachitical treatment with cod-liver oil, iron, strychnine in small doses, phosphorus, systematic exercise, and gentle hydrotherapeutic measures will restore the general health. The treatment with thyroid gland has not proved a great success in the average case.

Catalogry is quite rare in children. I have seen but three wellmarked cases, one of which, a boy of thirteen, landed finally in a line tic asylum. It is intimately related to hysteria and endersy, and often attended by psychical disorders. Both its prognosis and its treatment are dependent on the causes, among which fright, masturbation, chiorosis, malaria, helminthiasis, epilepsy, and melancholia have been enumerated. Thus, depletion, diaphoretics, emetics, nervinus, anthotminties, and electricity have been recommended. In most cases medicines are less effective than is attention to general hygiene, both physical and mental. In this respect it shares the fate and prognosis of hysteria, of which it may be considered one of the manifestations, the existence of which among children has been more extensively observed and studied since its nature, particularly in connection with musturbation, was discussed by me in 1875, (Amer. Jour. Obst. and Disof Women and Children). Hirschel and Fleisch observed catalepsy after intermittent fever, and Glas noted the case of a boy of five years who had an attack of catalepsy (instead of a chill), followed by perspiration. In these cases quinine and arsenic take the place of other treatment, with better success.

Another, though rare, symptom of hysteria is chorer surjer, which differs from chorea minor in the occasional appearance of paroxysms of coordinate spasms with psychopathic prodromi and (frequently) termination. Altogether, hysteria occurs with all the symptoms met with in adults. It is not confined to the female see in children any more than it is in adults, and exhibits the same debility and unitability of the nervous system in general and of emotions, reflexes, imaginations, and will in particular. Such children are by no means always anomic. Hyperasthesia (more frequent than amesthesia), parawthosia, localized paralysis (muscles of deglutition, first branch

[&]quot;Tetany should not be mistaken for a persistent muscular contractive of the extremities, mainly the distal ends, which may last many weeks and muscles. The latter has no interruptions, affects the thumb more than the fragers (with the characteristic (oblishtrical) shape of tetany), appears mostly in the early weeks of life, has need of the facial symptoms of tetany, is not connected with thachitis, and is not amountable to antirhachitical treatment. It depends sometimes on interinal disorders, but mostly on some affection of the central normous system, and should be treated accordingly.

of facial nerve, ptosis), paraplegia, strabismus, spinal and other neuralgias, hourse croupous cough and hiccough, general convulsions, incoordinate choreic movements, tachycardia, and pulpitations are among the symptoms. The lack of mental and emotional equilibrium is an early feature. That is why it is found endemic in schools and other institutions; who also the original moral incompetency may (mainly about puberty) degenerate into moral insanity, neurasthenia, melancholia, even mania. Vascenosce disturbances may cause "hysterical fever" with very high temperatures (from tot" to to8" F.), which usually rise suddenly, last but a short time mostly, and, when attended by no proportionate increase of the pulse, betray their origin at once. It is found in psychopathic families as the result of mental strain, in body ventilated schools, and depending on undurambition, masturbation, diseases of the ovary, and emotions. Hysteria in a child means, unfortunately, in most eases, hysteria for life. Still, training and education are capable of accomplishing a great deal in strengthening will and character and independence of thought. Such children are better off among strangers than at home. School sessions ought to be regular but short; work in the open air, housework, gymasstics, and hydrotherapy, with general roborants, are indicated and prove successful.

Atheronis, that peculiar form of localized (ends of upper extremities mostly) pronating, suplinating, flexing, and extending spasm, can hardly be improved when congenital. Now and then it accompanies poliomorphalitis or cerebral tumors or follows infectious fevers. Improvement is reported to have followed the use of arsenic, bromides, and galvanism.

Most cases of epilepsy are observed in, or date from, infuncy and childhood. In no disease is hereditary influence, not only direct but lateral, and that of other neuroses and of alcoholism more marked; the state of the future will have to see to it that epileptic persons are not placed in a condition to raise progeny equally cursed. Epileptic mothers must not nurse their habies. The child known to be epileptic must be trained very carefully, both physically and mentally. Alcobol and other stimulants, physical and mental exertions, and sudden emotions must be avoided. The hygiene of the skin and of the bowels requires particular care: the use of cold water (hibitual washing and friction) is imperative: constipation must not be permitted. Feeding with gruesome nursery stories, tight dressing, and early schooling, also horsehack exercise and swimming, are forbidden. In the interest both of the patient and of his schoolmates a public school should not be attended. The child ought to be instructed and trained with a view of preparing him for his future calling, which must not overstrain body or mind, must not be sedentary, nor should it confine him, if avoidable, to the limits and influences of city life and air.

The diet must be non-stimulant in every way. Dark meats must be avoided conscientiously, white meats allowed in small quantities. Citlorides, including sodium chloride, have been advised against. It has even been proposed to halo bread with sodium brouide in place of the chloride, and to give eggs without salt. Mile, fruit, vegetables, eggs, and bread are appropriate.

No case of epilepsy should remain without treatment. It is true that there are now and then spontaneous recoveries; even hereditary cases may get better or well; remissions are frequent; intervening acute diseases and many operations have frequently a favorable effect. On the other hand, Gerhardt saw a relapse after an intermission of twenty years. But the knowledge of these facts must not tempt us to procrastinate medicinal and hygienic interference, or to hold out a hope of recovery at the period of " second dentition," of " puberty," or of " marriage."

The best methods of treatment are always either specific or local. Symptomatic treatment may prove very successful with the aid of allhealing nature, but it is always a makeshift. The ideal indications for the cure of epilepsy ought to be-usy, must be-causal; its proximate sear is in the cerebral cortex, but its actual origin in anatomical lesions, mostly, of different localities. Thus, epilepsy may be cerebral, it may by the result of persistently abnormal circulation, or it may be of a reflex nature. A (brachial) "Jacksonian" epilepsy cured by the removal of a foreign lastly from the car was reported by Monfrer. A few cases have been traced to usual irritation and relieved by operations on the nares. All sorts of cerebral tumors, solid or cristic, this results of previous encephalitis and meningitis from insolation, othis. or otherwise; arrests of cerebral development; premature ossification of one, some, or all of the cramal sutures and footanelles; cerebral exhaustion from masturbation or premature venery; diseases of the heart with secondary venous obstruction; congestion from other causes (in a case of Gerhardt, enlargement of the thyroid); the influence of prolonged use of alcohol or ergor; the sluggish brain circulation attending constipation and the general socretic of intestinal autoinfection; external irritations such as tumors, diestrices, foreign bodies, and the reflex excitement produced by carious torth, Schneiderian hypertrophy, and nasal and naso-pharyageal growths; vesical and renal calcula: belurinthes, from tunia to toxyuris; in older children delayed menstruation, are so many different causes of epilepsy. It is,

therefore, only the most painstaking examination of all the organs and the whole surface of the body which gives a promise of finding the cause of the disease as well as the indications for rational causal treatment.

Arrests of corebral development are not amenable to treatment; the method of dealing with the chronic results of cerebral and meningeal inflammations, also the possible value of operations on prematurely ossified skulls, have been previously discussed. Most of the operations on the cranium undertaken for the purpose of healing epilepsy have not been successful, and the most enthusiastic promoters of such operations have rescinded their favorable opinions. Thus, the American Neurological Association, in a discussion which was uninly carried on by Suchs, Mills, Putnam, and P. C. Knapp, expressed itself very reservedly on this topic. But there is no doubt as to an occasional success, nor can there be any as to the feasibility of removing tumors from the surface of the cortex, or of opening and removing cysts and the results of new or old humatomata. B. Sachs and A. Gerster (Am. Jour. Med. Sci., October, 1896) came to the following conclusions. An operation is permissible in tranmatic epilepsy when the case is not over one or two years old. When there is a depression of bone, the operation is indicated at a later period, but should not be defaved. Trephining alone is sometimes sufficient. If the disease is of short duration, a part of the cortex may be excised. The complication with cerebral infantile paralysis, if the case he recent, is no contraindication to the operation. It must not be performed in epilepsy of long duration. Still, the human body not being a machine manufactured wholesale on a mirlorm last, and medicine not being mathematics, the indications both for medical and surgical interference are neither geometrically exact nor are they gospel. For these reasons mistakes are always liable to occur. facksonian epilepsy will not always exhibit, at operations or at autopsies, the local lesions holdly diagnosticated. Aye, recoveries may not be obtained, though no error be committed; for, indeed, habitual convolsions may be so firmly established that even the removal of their original source is no longer an efficient cure. But the insufficiency of medicinal treatment may be such as sometimes to necessitate or permit surgical interference as a possible last resort. Some surgeous are very optimistic in regard to the operation mainly for lacksonian epilepsy Braum (Deutache Zeitzeh, f. Chir., vol. xlviii., 1808) claims many recoveries or improvements; for instance, after the removal of hone splinters. "The operation should commence at the location of the injury; if that be without a result, the motor centre, the situation of which was first determined by the electrical current, should be removed to a depth of five milimetres. The operation may be performed after years have possed since the injury, though a shorter period is desirable." In non-traumatic Jacksonian epilepsy, however, Matthiolin reported 24.7 per cent. Intal cases in all operations. Equally unfavorable is the opinion of Chipault, who saw no favorable results of trephining in the same class of cases. The causes of death after these operations have been recorded as follows: meningitis, sepsis, prolapse of brain, bemorrhage, oscape of cerebro-spinal liquor, collapse, pneumonia, and pulmonary ordens. In connection with this subject I mention the resection of both cervical sympathetics and the upper and mobile cervical gaught. The verdict is: "not dangerous," but mefficient.

It is particularly in cases produced by reflex from cicatrices and sasal irritation that local treatment, excision, cauterization, and the removal of polypi and adenoid growths have their signal, though ture, triumphs. The eyes have been accused—" eye-strain"—of producing epilepsy, and hence have been submitted to operations. My ternaries on that subject, as connected with chorea, I can but repeal here. As regards local treatment, we have also to consider the effect on the genital organs when they are the cause of epilepsy. There is no doubt as to the occasional efficacy of digitalis, loquiin, or camphor in such cases. In others a chemical effect is aimed at; thus, in epilepsy from chronic lead poisoning, sulphur baths and sulphur and potassium isolide internally have exhibited good results.

If the approach of an attack be perceived, the patient ought to lie down on a low couch; the inhalation of anyl nitrite, if in time, has warded off many sciences; its offeet must not go beyond the first deep flush. If an aura rises from an extremity, a stout ligature around the limb may also not as a preventive, provided there is a palpable irritant-fee instance, a scar-from which the irritation may arise. Otherwise it is very much more probable that the aura which precedes the attack is "a sensory manifestation of an irritation the focus of which is within the cranium, with no-proof that the process is starting as a "discharge" in the motor area, but rather is equally explicable as an intracranial excitation referred to the periphery in the same fashion that irritation of a sensory nerve anywhere along its course is also referred to its periphery" (William H. Thompson in Festschrift in honor of Ahraham Jacobi). When the seizure cannot be prevented, it should not be interfered with; no hands must he forcibly opened, no convulsive jerking meddled with; but the patient must be protected against biting his tongue or otherwise hurting himself. Among the drugs recommended for epilepsy every narcoric and antispasmodic has had its day. Valerian, patonia, and artemisia were once highly thought of; so was belladoma, and later atropine, with its paralyzing influence on blood-vessels. Curare was praised for its effect on the muscles. Copper sulphate has been recommended. Silver mitrate, in closes of not more than one or two centigrammes daily (one-sixth or one-third grain), best in pills, may be continued, with intermissions, for a long time, and is credited with cures. It ought not, however, to be administered more than a month in succession, lest the skin show its effect. Twice in my life have I thus succeeded in producing argyria. Zinc has proved serviceable: the coide, the valerianate (from twenty-five to fifty centigrammes daily), and the sulphate. The latter I have made much use of, begiming with three centigrammes (one-half grain) three times daily for an adult (a child in proportion), in increasing doses. Four grammes (one drachm) are dissolved in one pint of water, the first dose being a teaspoonful for an adult, ten or twenty drops for a child, the second the same dose plus one drop, the third the same dose plus two drops, and so on until after twenty days the double dose, after forty days the treble dose is reached. It takes a long time for tolerance to become exhausted; should this happen, a small reduction of the dose is all that is required.

Kocher (Arch. M. Chir., vol. lix.) observes that tranmata, even without cicatrices and adhesions, cause epilepsy by mere increasing tension. That is why after trephining the dura mater should be divided or a piece excised. Increased tension is a direct cause of epilepsy, whether congenital, or through inflammation, or tumor, or transmatic alteration. In fact, every disturbance of the circulation may cause epilepsy; therefore it may follow extensive defects in the cranium; for "the intracranial circulation is arranged for a closed cranial capsule." Consequently, Kocher advises strongly to reduce the tension which causes or increases irritation by medication.

To reduce the irritability of the cortex and the general consulsihility, and of the peripheral sensory apparatus, and thus in the course of time to cure epilepsy, the main reliance is on the bromides. I have not been able to convince myself of the injuriousness of the potassium salt. A belief in its harmful action has been the cause of the substitution of the sodium, or a mixture of the potassium, sodium, and ammonium salts. Whichever plan is followed, there are certain rules which are paramount. The remedy must be given for years; it must not be interrupted unless there have been no seizures for years, except for very good reasons (excessive some, paresis, supor, headache, and perhaps the intervention of acute diseases). The doses must be sufficient; a child of two years may take three or four grammes (forty-five or sixty grains) daily. It is best to give a large dose at bedtime, perhaps half of the daily amount; in this way the errebral symptoms of overslosing are most readily avoided. When they appear the dose may be restaced, but, except in rare instances, the remedy should not be stopped altogether. Perhaps the strontium or lithium salt may take its place for a time, but I cannot say that either has impressed me with the superiority which has been claimed for them. The addition of moderate doses of digitalis has often appeared to me to reduce the drowniness brought on by protracted large doses. Arsenic in small but regular doses will lessen the tendency to acue.

I cannot say that bronsides are badly tolerated in the evening, rather the contrary; still, it is stated that they have a disagreeable effect. In that case a sufficient dose of amylene hydrate or of chloral hydrate to produce sleep should take their place. Weber, of Dahldorl, precedes his bronside treatment with a regular course of anylene hydrate; on the other hand, there are those who condemn its use altogether because of injurious effects which they say they have observed (Jastrowitz, Jolly).

Flechsig combines the sodium beomide treatment with that of onium. His two or three daily doses of the latter, for adults, are from five to ten or twenty-five or thirty-five centigrammes each (five-seaths to six grains) Large doses cannot, however, be given except in wellsupervised institutions. After six weeks it is suddenly discontinued and replaced by 7.5 grammes shally (two draciums) of the beomide. After this treatment has been continued two months the daily dose is reduced to two grammes. Only when fright or other emotions were the proximate causes the two remolies were combined early. Flechsig predicts no direct effect, but only a preparatory action of the opiate. Indeed, during the opium treatment there was no relief; but in combination with sodium bromide, cases which had lasted decades were improved. Railcliffe, however (according to Gowers, Laucet, 1880, p. 552), found opium effective in some cases. Gowers saw but rarely any good effects from bromides and opium combined. but believes in the usefulness of small subcutaneous doses of morphine when attacks reappear often and violently. He frequently comhines bromides with digitalis, Bechterew with adonis, Mneli combines or alternates with atropine. Chloral hydrate was urged by Seguin in enemata, either by itself or in combination. The latest journal reports on the Flechsig treatment are very contradictory.

From Charles A. Dana I learned the use of urethan, which was recommended by Demme in the eclampsia of children, in epilepsy. I have seen it stop epileptic convulsions (fifty every day, severe and mild) within a few days, not to return for more than half a year, when the child died from causes not connected with her epilepsy. The doses amounted to from two to three grammes (half a drachm to two scruples) a day, sometimes refracted; sometimes a large dose was given at bedtime.

Pasteur observed that in a patient under treatment for hydrophobia the epileptic attacks ceased (as they do cease after operations of any kind, strong emotions, or acute diseases). For this reason Charcot suggested systematic injections of rabic virus for the purpose of relieving or curing epilepsy. Gibier imitated the process and reported good results. Pierre Marie goes so far—a good deal too far—as to believe that "idiopathic epilepsy," which he asserts to be frequent, is of infectious origin in almost every case, is therefore preventable, and ought to be treated and cured with microbic toxin (Senarine Médicale, 1892, p. 283).

The number of epileptics is so large, and the influence of the disease upon the intellectual, moral, and physical condition of the individual, as well as upon the state and mankind, so wide-spread, as to be alarming. The subject has finally roused the anxiety of philanthropists to a great extent. Country settlements of epileptics have been established in Europe, with beneficial results. As a result of combined efforts the following resolution was passed at a meeting of the American Neurological Association:

"That it is the manimous sense of the American Neurological Association that the proper care of the epileptic class, so long delayed, be urged upon the public, upon State authorities, and especially upon all interested in the care of the sick and defective poor, whereby they may be retired from asylums and almshouses, and may receive the required care in such separate establishments as their deplorable situations demand."

The Craig Colony for Epileptics, at Sonyea, in Livingston County, New York, has published its eighth annual report. The world is moving.

Salaon spasse (spanear entage), a peculiar affection of muscles of the neck, either the sterno-cleido-mustoid and trapezius, which are controlled by the accessory nerve, or the rectus anterior capitis, longus colli, and the scaleni. Bad cases may show contraction of the levator anguli scapulæ, deltoid, biceps, and diaphragm, also the glottis. Nyatagunas, noticed when there are cortical disturbances which may

lead to epilepsy, must receive the treatment proper for its causes. As a predisposing cause rhachitis is pre-eminent. Perhaps the encephalic changes of rhachitis are in many instances the main cause of the spasm. The age of the patients (from four to twelve months) is still the age of amsteady eyes and maggling movements of the head. Insufficient light in the dwelling gives rise to eye-strain and consequent exhaustion of the cerebral centres. The spasm often sens in during the weakness of convalescence and nearly always during the excitable period of teething. There was also sometimes the history of a blow on the head, which means a fright (John Thomson in Festschrift in honor of A. Jacobi, 1900). In some cases there were intestinal disorders.

Rotatory sparses, combined or not with squinting, nystagmus, and mental disturbances, solitatory, energing, yearning, mapping, spitting, history sparses, should be treated according to their origin. Most of them are symptoms of hysteria. Many of the patients are thoroughly anamic. There are indications for potassium bromide, the positive pole of the galvanie current upon the convulsive muscle (sterno-eleido-masteid (or) and traperius), also massage and anti-rhachitical treatment; besides the closest attention to ober and bygiene.

Stammering is pre-eminently a disease of the nervous system, and is probably caused by a diseased condition or insufficient tone of the cerebral cortex, with lack of equilibrium, exhibited in some by choleric temperament, in others by cowardice, together with disturbance of will-power and an absence of coordination of respiration and the waseles of the laryax and mouth. In some it is the result of veryous talkativeness, fidgetiness, and flightiness on the part of parents or attendants; in some of initation not checked at the proper time. Strengthening of mind and body is the main indication. Training, cold water, and exercise will fortify the character; bromides may for a time relieve irritability. Coordination of innervation and muscle may be achieved by loud and slow speaking and by reading, reciting, and singing. Self-confidence must be encouraged in every way. Among strangers and in institutions established for the purpose, with good air and food, and plenty of exercise with foreible exercises of the diaphragm, such patients are mouth benefited, not infrequently in a short time. Local affections of the respiratory tract must be attended to, adenoid vegetations of the naso-pharynx removed, and other anomalies of the sures, provided they interfere with respiration. corrected.

VII

Diseases of the Digestive Organs

A. THE MOUTH.

1. Franum of the Upper Lip.

The upper lip is retracted and remains short, and the mouth is kept open when the framum of the upper lip is short and hard. It should be incised and loosened.

2. Harelift and Finner of the Palete.

Harelip should undergo an operation, unless there be a strong contraindication, on the first day, or at all events early in life. The difficulty of nursing is, in part, obviated by the successful closure of the cleft in the upper lip, and the sooner the deformity is removed the better are the chances for a correct position of the future teeth, for articulation, and for the shaping of the upper lip and nose.

Fissure of the palate requires an erect posture during feeding. A plustic operation to close a fissure of the palate is indicated when the alveolar processes are not too steep and the tissues sufficiently normal and copious to permit a complete occlusion. At the same time the patient should enjoy general good health and be intelligent amough to aid in the operation. Before the sixth or seventh year of life the latter cannot be expected. The early periods of infancy are not favorable times for the operation, but a vital indication is furnished by the necessity of sufficient feeding and the danger of bronchitis and pneumonia resulting from the easy access of cold or contaminated air. If the operation can be performed before the child speaks, the prognosis in regard to articulation is very much better. Still, insufficient strength, whooping-cough, bronchitis, etc., are powerful contraindications.

3. Tamers in the Oral Cavity.

An advance of the parotid was noticed in a nursling by Eriss. Fibrowa occurs in the periosteum, ruchandrowa and automa in the lower jaw, surcome (epulis) in the alveolar process, where it mostly originates in the periosteum. They should be removed soon. The first (of the very few cases on record) congenital surcoms of the tangue I reported in 1869 (James Obst. and Dis. of Wemen and

Children). It was removed by the gatvano-cantery. Biedert ("Lehrb d. Kind.," 11th ed., 1894, p. 168) reports the case of a girl of ten years with surcosse, which commenced in a toucil and extended over all the neighboring organs. When she seemed to be almost moribund she was taken with erysipelas and got well. The report was made eight years after her recovery, which took place with considerable cicatrization. The case holds out great hopes for Coley's treatment of surcoma by means of the serum prepared from the streptococcus of erysipelas and the bacillus prodigiouss.

4. Ravalo.

The sublingual glands are sometimes seen as gentle elevations when the tongue is normally raised. Some acini of one or both glands, however, may undergo cystic degeneration and form crossof any size up to that of a pigeon's egg. The same sort of cystic tumors are formed in the obstructed Rivinian duct and in the lymphducts between the genio-byold inuscles, very rarely in the ductus linguals or its ramifications. When they impede nursing, deglicition, or respiration, they should be removed. As the walls are very thin (mostly), enucleation is not practicable; the simple incision is rather useless because it will soon close up; the introduction of a silkthread seton may favor suppuration and sepsis; the removal of a fairly large part of the visible wall, which is then turned in and satured, with subsequent application of carbolic acid or of the silver nitrate stick (with immediate application of salt solution afterwards), gives the best results. Cysts formed by congenital obstruction of the Whartonism duct should not be called ranula. Dermoids and degenerations of the submaxillary glands, also lymphangiomata, are met with that should not be mistaken for rannia.

Concretions in the efferent ducts of the sublingual and the stabmaxillary glands can usually be expelled by gentle pressure. If not, a short incision will free them.

5. Milio. Epithelial Pearls.

Along and near the raphe of the palate of the newly-horn and norsling there are (sometimes numerous) hard, yellowish-white conglomerates of small size. Now and then they rise above the level of the surface. They are usually (not cystic, not comedones) accumulations of epithelia in the small vacnoles of the mucous membrane. Mostly they disappear spontaneously, sometimes, under the influence of injury and microbes, they alcerate. Pus is occasionally seen. I have observed perforations of the palate. In that condition they are sensitive or painful, interfere with nursing and nutrition, and are the starting-points of thrush or of still more serious infectious diseases. Then, but then only, a daily application of a solution of silver nitrate (1 to 50 or 500), mild when only the surface is ulcerating, and frequent brushing (not rubbing) with a solution of potassium chlorate or of softsim biborate (1 to 30 or 40) will be all that is required.

The perforation alluded to is very exceptional. Syphilitic and diphtheritic (rare) perforations furnish their own indications both for local and general treatment.

6. Stowalitis.

The cutarrhal form, mostly with inflammation of the gums (gingivitir), results from uncleanliness (retention of food in the mouth), from constant sucking on fingers and nipples, or is observed in connection with masal catarrh, glossitis, pharyngitis, gastro-enteritis, peritonitis, or the exanthematic acute eruptions. This mild form demands cleanliness, drinking of cool water (mainly after every feeding), cooler temperature of the food, unless it be breast-milk, and washing either with potassium chlorate or borax solutions. In those cases in which the mucous membranes and the tongue are dry, a solution of silver nitrate () to 500 or 2000) should be brushed on once a day.

The follicular form, in which vestcles are found over the nucous membranes, tongue, and pharynx (not the gums), with a tendency to rupture, is very painful, is often attended by high temperatures, and interferes with swallowing; it should be treated, besides locally, with potassium chlorate, eight grains (0.5) in five ounces (150.0) of water and glycerin (10 or (5 to 1), a tenspoonful to be taken every half-hour, and no water to be given immediately after, so as to secure the local with the general effect.

The alcerous variety (atomacace) originates in the gums of children between two and eight years of age. It affects the lower (more frequently than the upper) incisers and canines on injured epithelium, after careless cleansing and washing, sucking of soiled fingers (cocci, etc.), and the milk of cows affected with foot-and-mouth disease. Fruhwald claims to have found a bacillus not met with in the healthy mouth, also cocci; Bernheim, a bacillus and a spirochaete. The tione becomes hypersemic, bluish, and undergoes a rapid parenchymatous disintegration, looks white, is soft, breaks down, loosem the teeth, and attacks the adjoining angle of the mouth and checks, which undergo the same destruction. There are copious sulvation, offensive odor, and sometimes extensive necrosis of bones. As it is mainly observed after measles (most frequently) or premmonia and infectious diseases generally, often in rharbitical and scrodulous children, and in nurseries and formilling asylums of the old (?) style, feeding (which is often resisted), tonics, and stimulants are orgently indicated. Internally, potassium chlorate as in the foliacular form, in doses not targer, but more frequent. Most cases do not require anything besides, with the exception, perhaps, of the local application, a few times a day, of potassium permanganate solutions (1 to 250 or 500) or of an attenuated fincture of iodine. Bad cases terminate in extensive destruction of an angle of the mouth and adjoining cheek. Secondary name is rare.

The aphthous variety, with yellowish or gray spherical and flat sibrinous deposits between the epithelium and the tissue of the mucous membrane, sometimes complicated with small hemorrhages, may become dangerous when grave, and may interfere with swallowing. When there is a tendency to superficial iderration, silver nitrate in mater (1 to 50) may be gontly applied once daily. Other treatment has been outlined above. Chronic neurotic stomatitis will be discussed in Chapter XI.

Hemorrhagic stomatitis is observed in scurvy, in diphtheria, and in other infectious diseases: the diphtherise form in diphtheria; the exphiline, with its circumscribed whitish or grayish condylomata and other symptoms, in now, larynx, skin, or bones, in syphilis. The treatment of these local monifestations has been discussed in other chapters. Mercurial stomatitis is rarely seen in infants and children the less so the younger they are. When it does occur, potassium chlorate internally, in small and frequent doses, and as a month-wash (1 to 30), is as good a curative as it is a preventive.

All of these forms of stomatitis have a marked influence on the lymph-bodies of the neighborhood, mostly below the lower jaw, but also those of the check. These are located on the lower jaw, on the upper jaw, behind the angle of the lower jaw, and near the orifice of the Stenorian duct. As a rule, their tuniefaction will disappear with the reduction of the symptoms of the stomatitis which cannot them.

7. "Bedner's Aphtha."

They are not aphthie, but flat and more or loss extensive ulcerations, resulting from atrophy of and injury to the epithelium and mucous membrane of the alweolar processes and the palate of the very young (first month), also around the epithelial pearls near the raphe. In the newly-horn a moderate physiological desquantation takes place on all the integraments, both skin and muons membranes. Thus, normally, the epithelium is thrown off. The oral mucous membrane is very tim, over the posterior alveolar process it is very tense, and mostly so about the insertion of the pterygo-mantibular ligament. There, while the mouth of the newly-born is kept open, the nuncous membrane becomes quite pale. A slight stomatitis, a modcrate ill-mitrition, and careless and rough handling of the mouth of the baby cause abrasions and ulcerations, which may be quite small or extend over square inches. They are dangerous to the same degree as they interfere with norsing or feeding and facilitate the invasion of microbes, which are numerous, but accidental, either saprophytes or pathogenic. These may cause an infectious disease, Thrush is a frequent sequela. The above etiological remarks preach the sermon of prevention. Look after your masses, their finger-nails, and the material they shove into the habies' mouths. Silver witrate (1 to 250 or 1000) in one daily application, and gentle brushing with boracie acid (a to 30 or 50), or with softum biborate, will mostly suifice. If a stronger disinfectant be required, potassium permanganate (1 to 200 or 500) is preferable. Much crying on the part of the haby is injurious by the stretching of the mucous membrane of the posterior lower alveolar processes. After each meal a few traspoonfuls of water should be given to clear the mouth of food remnants.

8. Thruth.

Membraneur stomatitis is very frequent and popularly known as thrush (muguet). The postnatal desquamation of the epithelium, the open mouth which allows the constant passage of air and microbes, the narrow mares which add to that predisposition, uncleanlineso, retention of food in the mouth, excess of sugar in the food, and previous pneumonia or infectious disease, which adds to the hypersemia. of the oral carity, facilitates the deposit of oidium (no healthy epithefrom permits it), which, with streptococci and staphylococci, detritus, a little fibrin, and foreign remmants, form deposits, granulations, and membranes mainly on surfaces covered with payement epithelium (month, tonsils). Oidirm is also found in the intertrigo of the nates, occasionally even in the cranial cavity; its genidia are met with in the gastro-intestinal tract, where they cause gastritis and enteritis, atrophy, and possibly death. It is therefore necessary to treat thrush early. The membranes can almost always be scraped off easily. A solution of boric acid (three or four per cent.), of sodium biborate (two or three per cent.), or of potassium permanganate (one-half to one per cent.) should be applied five or six times daily. A daily application of silver nitrate (1 to 500) is useful after the membranes have been removed. Internally, as gastro-intestinal complications are frequent, reservin and bismuth may be administered (bismuth subcarbonate one gramme = grs. 15, resorvin twenty-five to forty centigrammes = grs. 4 to 6, water fifty grammes, glycerin ten, a teaspoonful every two hours).

g. Nonu.

Phlegmonous gangrene of the cheek, sometimes originating in the gums, is commonly known as nown. It is of unknown cause (nemopathic, microbic, thrombotic?); at all events, no bacillus has as yet been identified as its cause or regular attendant, with the exception of the endemic described by G. Bloomer and A. Macfarlano in the Appre-Joseph Med. Sci., November, 1901. Leptothrix was found in each of their sixteen cases (mouth, vulva, rectum, alone or in combination), As isolation stopped it, contagion is probable (by sorp? towels?). The worst complication was preumonia, the best remedy the thermo-cautery. It is mostly observed after measles, typhoid fever, scarfatim, or other infectious diseases, or after reckless mercurialization. The same process, under the same circumstances, may be observed about the vulva, arms, and other parts. It never occurs in the healthy child. During the process the blood-vessels, nerves, and Stenonian duct may take part in the disintegration, or remain intact; when the blood is not congulated in the vessels, a case may die, while apparently getting better, of a honorrlage which in the septic condition of the patient need not be large. The mortality is high, more than seventy-five per cent. The hard, black node grows fast, the fearfully fetid ulceration destroys soft parts, teeth, benes, and finally life, unless the process be stopped. The actual cautery (electro-, thermo-cautery) employed once or more is most effective, also fuming nitric or sulplinric acid. or a ten-per-cent, solution of zinc chloride; when it has stopped, potassium permanganate (r to 100) or the dioxide may be applied, or tineture of iodine, or formalin (1 to 15 or 30). The strongest stimulants in large doses-alcoholic beverages, musk, and stryclinine -should be given. As it is mostly seen after infectious diseases, etc., we should learn the lesson of not relying too much on the lazy nibilism of thoughtless "expectant" methods.

10. Sublingual Adentis.

The infammation of the sublingual gland (sometimes connected with parotitis) is mostly seen in the puerperal infections of the newlyborn, but also in after-years. It may heal, but requires early incision to relieve the pus, and frequent disinfection with potassium permangamate (1 to 200 or 500 water). The abscess may become very large if the surrounding cellular tissue participates in the suppuration. The incision should be large, and disinfection very careful.

tt. Parotitis.

The endemic and epidemic varieties were treated of on page 220. If the Stenonian duct be obstructed by simple or mercurial or ulcerous stomaticis, or by diphtheritic deposits, the gland will swell and become inflamed. Cold applications, gentle massage with green soap, or with a potassium todide lanolin ointment, will succeed, unless there be suppuration. In this case an incision is required. A metastatic form of parotitis, with numerous cocci in the pus, may be observed in various, typhoid fever, scarlatins, and amenia. Warm fomentations, large incision, and thorough disinfection are demanded.

12. Difficult Destition.

Dentition is a physiological process; before a tooth protrudes the gums above it are slowly absorbed so as to show a slight depression, with no hyperiemia. Some time previously the gums are raised and more or less hyperamic. The only perceptible symptom is the eagerness of the baby to bite. Increased salivation has nothing to do with electrition, but with the increased function of the salivary glands, which, like the growth of the teeth, of the head, and of the brain, is the result of the physiological hyperemia of that part of the body connected with the large size of the carotid arteries. When the gums are abnormal, hard, tense, perhaps under the influence of a stomatitis, there may be a slight fever, bot head, sleeplosaness which is improved by taking the baby up (head elevated), even some muscular twitching; for at that time of life excitability is great and inhibition insufficient. Diarrhosa is not a result of the normal teething process. This extends over the foctal and infant periods; what is often called so is only its termination. One or two decigrammes of a beomide may be given (one and one-half or three grains) once or often, and the mouth should be washed with cool water. The long period of destition is also the time of many disorders and diseases, which are not always easily diagnosticated and may tempt the practitioner to suggest or accept the diagnosis of difficult teething. Lancing the gums, which, with calomel, used to be the every-day treatment of infants at the time of teething, has lost most of its charms. There are, fortunately, practitioners who prefer making a diagnosis of the real condition of the ailing boby, and that and its improvement or cure comprise the main treatment I recommend for "difficult dentition."

Great care, however, should be taken of the teeth. They should be washed after every meal and rubbed off. Caries grows very rapidly; the loss of a tooth results in narrowing the place for the permanent tooth that is to follow, perhaps after years only; extraction should be resorted to only for painful pulpitis or for purulent osteo-periositis. In rare cases a temporary tooth should be removed when it prevents the permanent from protruding.

13. Dental Ulceration. Riga's Disease.

When there are but two lower incisors, and they the only treth present, the tengue is irritated by contact and friction; that is, as is readile understood, particularly frequent in whooping-cough. In this way the dental ulceration is caused. When the irritation lasts long, and results in a secondary inflammation with hyperplasia of the tissue. the tongue adjoining the framium is not only discolored, gravish, and slightly granulating, but exhibits a slight excrescence, with a somewhat irregular surface and of marked density. Fibroma has been met with. That is what is called Riga's disease by Fede and Concetti, who say it is very rare in Rome, but very common and often grave in some parts of Southern Italy. Infants with vulnerable tissues are most apt to be affected; moreover, the sore surface, being very much exposed, may become a breeding-place for pathogenic microbes and their toxins; diphtheria, sepsis, cachexia are thus exgendered. The same is an unnecessary addition to our nomenclature. According to the condition of the surface, it may be moistened frequently with a solution of potassium chlorate, or of borax, or of potassium permanganate, or of the dioxide, or be cauterized with the solid stick of silver nitrate once every two days, or the actual cantery. The obseration or tumor is almost certain to disappear when a few more teeth make their appearance in the lower law. Mild cases may get well without any treatment. Bad cases will improve with recovery from accompanying atrophy or cachexia.

B. THE TONGUE.

1. Congenital Anomalies.

They are more or less amenable to surgical treatment. The hind longue (arrest of development, consisting in the non-juncture of the two habres of the first branchial arch) may thus be improved. I removed a surcosse with the galvanto-cautery (p. 300). Liposus is mostly located on the tip of the tongue; is quite small, or reaches the size of a hen's egg; is sometimes pedimenlated, and interferes with

nursing and nutrition. It should be extirpated, as also deemoids and cyclic hygromata. The latter may also be injected with an irritant duid (Lugol's solution, alcohol); Ironfringiona may be punctured with the actual cantery in different places. The latter is one of the forms of warreglossia; its other variety is muscular; it is mainly this latter which enlarges the tongue in every direction, makes it protrude and excoriate, and dislodges the teeth. It has been reduced by the ecrascur and by ignipuncture. A wedge-shaped piece may be excised and the flaps joined. Hypertrophy of the tongue accompanying any of the varieties of cretinism requires the prolonged use of thyroid. Adhesion of the tongue to the floor of the mouth (anhylaglossia), when in the rare form of extensive epithelial cohesion, is easily relieved by gentle traction, or separated by means of a blant probe; when caused by the shortness and extensive insertion of the framum, it requires an incision by seissors. It is better to make a superficial incision only than to cause a hemorrhage which is stopped with difficulty. The affection does not interfere with nursing, so that the little operation is not urgent. A further contraindication to making a long incision into the frænum is the possibility of rendering the tongue too movable, and thus facilitating antiration of the tongue. which may prove fatal. In that condition the lower lip is drawn in and the tongue hackward so as to prevent respiration. In a few cases it was observed in whooping-cough and larengospasm; in the majority its original cause was obstruction of the nose by coryza, or congenital narrowness of the nostrils, or a swelled floor of the mouth. Insufficient innervation of the songue has also been charged with occasioning its aspiration. The treatment of the difficulty depends on its etiology.

2. Glosnilis.

Superficial changes of the tongue (evithena, cutarrh) participate frequently in the same alterations of stomatitis, pharyagitis, infectious diseases, and digestive disorders. The latter do not influence the tongue, however, so much as they do in adults. These superficial alterations require no treatment. Very little, if any, is required in the peculiar changes of the epithelium, which is thrown off in the shape of smaller or larger islands and accumulated so as to form whitish and elevated edges round the bare spots (geographical towers). It is only had cases that require treatment. Lactic acid in solution has been recommended. I prefer silver nitrate once daily (1 to 500). A similar solution (1 to 1000) I recommend on the smooth red tongue with or without famore; it is mainly the latter which should be touched by the medicine. A mouth-wash of

potassium chlorate and the internal administration of the same are beneficial in all of these conditions, alone or in combination with the above; also in most incertaione, those caused by carious teeth, or in the attacks of epilepsy. The ulcerations caused by overdroes of mercury and accompanying ginginitis and salivation require frequent and small doses of potassium chlorate; for a child of two years one gramme (fifteen grains) daily. The acute inflammation of the torque (acute glosnitis), however, should not have to wait for the slow effect of any treatment. Its rapid swelling and intense redness, with a tendency to suppuration, denomd a deep and long incision rather than a mere starification of the surface.

C. THE THEORY.

1. Pharyagitis, including Amygdelitis (Tousillitis), Hemorrhage.

It is met with in many varieties,-catarrhal, phlegmorous, erysipelatous, lacmar, follicular, and purenchymatous. All the diseases of the mouth may descend into the pluryux. The catavial infammation of the pharytts is, however, apt to be more serious; fever, dynplingin, even convulsions, are noticed, besides annoying or dangerous complications with most diseases. Exposure, dry (furnace) air, or exertion (screaming) may bring it on. Nasal irrigations of warm (60° F.) saline solution relieve the paso-pharyux and the pharyux of accumulations of mucus. Gargles are not so reliable (p. 76) as applications of ice-cloths or of ice-bags, potassium chlorate as advised above, with small doses of tincture of belladoma, also an astringent spray for dorile older children. Tonells, when acutely smollen, are relieved by a scarification made at an early period. In that way chronicity may be avoided, with its constant liability to admit microbic infection and to cause the development of adenoid vegetations. The facume (crypts) of the tonsils, as they do not recede into the tonsillar tissue, but are mere surface depressions, are the seat of a esperficial process partly parasitic and partly irritative. Lacuntar amogulalitis is rare in infants, more common later; its fever is high or not; glandular swellings of the neighborhood are quite common (Koplik in Festschrift). The deposits-sometimes large enough to form membranes-are made up of epithelium, erythrocytes, leucocytes, detritus, bacilli, and cocci, or, instead of the latter, in rare cases, leptothrix. This latter form was first described by B. Fracakel in 1873 and Emil Gruening in 1882, and lately by Alois Epstein (Festschrift, 1900), who gives the interesting history of the affection (Graening is not mentioned). It is not at all a disease of adults, as

Boulay supposed. The deposits are widely disseminated over the tonsel distant from one another, firmly adhering, persistent, not surrounded by an inflamed surface, pale and dry, and rasily distinguished from follicular deposits and membranes by their appearance, course, and microscopical structure. Loose deposits may be semped off, and the sore surface (in docide children) touched with concentrated carbolic acid, or silver nitrate either solid or in strong solution, or mitigated tincture of iodine, or Lugol's solution. Potassium chlorate in frequent small doses internally.

Followlar awygdalitis, the process being in the depths of the follicles, is liable to cause more general symptoms. High fever, pain, headache, even convulsions are very common. Epithelia, detrims, and a great variety of microbes form the tufts rising out of the follicles and the membranes in which a number of tufts coalesce.

Parenchymatous inflammation of the tonsils shares the character and symptoms of phlegmonous pharyngitis in general, sometimes to an unusual degree. It results from or follows the (catarrhal or) follicular variety. Being caused by the latter, it is at first circumscribed, the abscess originating in a single follicle. That is why it is mostly on one side only, but may occur once or twice a year until all the follicles are destroyed by suppuration. An early incision should be made and followed by disinfectant gargles or medicine (potassium chlorate).

The abscesses of phlogonousus phargyugitis may be found anywhere, without a trace, perhaps, of a microbic cause. Some are found in the submiccous tissue, some hidden behind a tonsil. They require an early incision. Erysipelar of the pharyux has no tendency to suppuration, but to considerable swelling, which may be so intense as to demand tracheotomy. If intubation he possible, it should be preferred. Ice applications; ice-pills. Baginsky recommends a five-percent, ichthyrd vaseline ointment.

The abronic form of parenchymatous unygdalins is sometimes congenital (often hereditary), otherwise the result of repeated acute processes. Scrofula prediaposes. In five per cent, of a large number of examinations the swelled tonsils were subscrular: in them tuberculosis is either primary or secondary to pulmonary or other tuberculosis (even the miliary acute form). Neighboring lymph-hodies may become infected from them; less so, it appears, the follicular glands of the base of the tongue. Month-breathing, vertigo, nocturnal (morning) cough, dyspmora, incontinence of urine, night-terrors, ear affections, mental hebetude, rheumatic affections, and insufficient development of the chest are symptoms or consequences. The chronically

enlarged mass cannot be influenced by medication or astringent applications. It is useless to tamper with caustics of any kind. Resection is the only quick relief, to be followed, mainly during epidemics of diphtheria, by disinfectant washes or medicines. If the anterior arch of the soft palate is adhering to the tonsils, it must be loosened first to avoid bemorrhage. For the same reason the tonsil should not be drawn out too much, nor the instrument unduly pressed in. If this occur (the tonsillar artery has large branches in the capsule), the readiest means to suppress it is digital compression inside. If the operation he objected to, the galvano-cautery (after anasthesis by escaine) may take its place.

Follicles which remain open and permit a probe to enter a centimetre and more are the causes of constant annoyances, new deposits, microbic invasions, etc. They ought to be burned out with the electrocautery or ripped open with a rectangular book suggested by Moritz Schmidt and improved by Gleitsmann, who sharpens one of the edges.

Hemorehages from the pharyex are not very infrequent, mild or grave. The treatment should be indicated by the causes; rusal and naso-pharyageal and pulmonary bleeding may be mistaken for pluryugeal. Pharyngeal catarrh, varicosities of the posterior aspect of the uvula, and varices of the base of the tongue and the lingual torsit are occasionally met with. A foreign body or an attack of whoogingcough may burst blood-vessels; luemophilia, senrey, and leucocythamia may predispose to bleeding. In infectious fevers, mainly in diphtheria, wild (or grave) mosal and pharyngeal honorrhages may ocenir. Greenhow on Diplitheria, 1860, p. 200, relates: "Mr. Wil-Same had a fatal case in which the patient died apparently from the profuse discharge of bloody santes resembling claret from the throat, amounting to two pints per day." Similar cases we saw often during grave epidemics thirty and more years ago. Operation on a tomil may cause it, primarily or secondarily. Primary or secondary benorrhages after incision or ropture of blood-vessels are not rare. Ulcerations of syphilis are not often found in children. Septic ulcorations are frequent, and usually give rise to small bleedings. When large bloodvessels are eroded, hemorrhage may prove fatal. I have known the internal caretid to bleed four times during several days in a child of four years until she died. The artery should have been ligated.

z. Retro- and Latero-Pharyngeal Abscess.

The lymph-nodes of the posterior wall of the pharyax drain the tonsils; the deep facial glands the orbit, jaw. pharyax, and middle

ear; the inperior deep cervical glands the cranium largus, thyroid, and pharyus. The rapid growth and intense hyperamia of all the parts concerned during the first year of life, the frequency of stemahtis. plaryngitis, and rhinitis, also otitis, and the activity of the lymphsystem at that period explain the frequency of retro-pharysgeal abseess in the second half of the first year. After the completion of the second year it is rare; after that the importance of the lymph-hodies of that region diminishes from year to year. In the adult the lateral pharmgeal lymph-bodies exist, but they are small; a number of small accessory lymph-hodies alongside the pharenx apparently become atrophied. Cases depending on gennine caseous inherculosis of lymph-nodes are very rare; those resulting from caries of a vertebra, which sometimes runs a protracted course without any symptoms. not frommit. After all, Koplik (N. Y. Med. Journ., April 4, 18(6)) justly declines to accept the existence and name of idiopathic abscess; he, Neumann, and others found strepto- and staphylococci in all; indeed, nothing should be called idiopathic the cause of which is primarily located in another organ, or at a distance, though in the same class of tissue. The worst cases are those developed out of scarlatinous pharyugitis or during crysipelas (rare) or measles, also typhoid and influenza; they have a tendency to become gangrenous and to descend into the mediastinum, or to be, on the basis of uniform infection, complicated with pseumonia or suppurative pleurisy. That is to principally when the small lymph-bodies situated in the succulent tissue between the pharynx and the prevertebral muscle are affected. It is these abscesses that perforate behind the pharvnx and osophagus and have a tendency to descend. The diagnosis is secured by dyspnotic, interrupted, enoring respiration, stiff neck (often held back and sideways), difficult deglutition, tinny voice, which will not be forgotten if once heard, frequently by the occurrence of a lateral swelling which can be seen outside, and by the presence of a posterior or lateral swelling which can more often be felt than seen. The symptoms are mostly urgent, sudden deaths not uncommon, and the abscess. should be opened when felt or even indistinctly felt to fluctuate. No angethesia. Hard swellings (in rare cases syphilitie) should not be incised. The finger should never be permitted to burst an abscess, though ever so soft: for, the pluryngeal space being narrow (the larynx, as shown by Symington, is higher by one vertebra in a child than in an adult), pus, which is usually quite copious, may be forced into the larynx. The abscess may be opened in most cases by a hard silver probe or director, which is sun in suickly and made to tear a long spening, in others with a histoury covered to nearly its

point with adhesive plaster, or, better, with a owered knife which as withdrawn at once and the sheath of which is used to enlarge the opening. Immediately after the incision the head of the patient should be thrown forward and gentle pressure employed laterally, There is rarely any hemorrhage; if there by, ice may be forced into the mouth; or see-water injected into it foreibly, a single moment, will contract by peflex the small bleeding vessels. A game tampon is rarely required. A sponge with a solution of antipyrin (from ten to forty per cent.) will seldom be required. If the opening is large enough, a second incision will not often by necessary. When the tonsils are, and always have been, large, it has become necessary to begin the operation with the resection of a tonsil. In all cases in which the lateral swelling is large and fluctuating, or where the abscess is due to vertebral disease or to scarlatinous or other sepsis, it is hest to incise laterally behind the sterno-cleido-mustoid muscle when the aboress is below the larynx, in front of that muscle when the aboress is above it, and to disinfect and drain. This method should not be followed except in the cases indicated, or when the month cannot be opened (contraction of the masseters), or when the presence of the abscess is diagnosticated, but its location such as not to be reached by an incision from inside. The after-treatment is like that of plileymonous pharyngitis generally.

The diagnosis from a lacenatoms or from an angiomatous tumor, both of which are rare, should not be missed; for a mistaken diagnosis may cause death. Dangerous bemorrhages may take place from a branch of the placeyngeal artery when the anterior palate is injured in a resection of the tonsil, or from a branch of the external maxillary artery when a peritonsillar or latero-pharyngeal abscess in incised far away to the right or to the left. Septic abscesses may also lead to the spontaneous perforation of a large artery. Four hemorrhages took place within six days, the last of which proved fatal, in a case of latero-pharyngeal abscess which resulted from what appeared to be a mild case of a streptococcus pharyngitis. The autopsy revealed a large opening in the right internal curotid, which should have been ligated to save the child (p. 320).

3. Advisoid Pegetations.

They were first described by W. Meyer, of Copenhagen, in 1870and their influence on articulation, hearing, intellectual development, and the countenance recorded. They are lymphoid swellings in great numbers, sometimes covering the whole pharyngeal roof, sometimes accumulated in one large mass (Luschku's "pharyngeal son-

sal"), or in two masses with a groove between them. They cause or are dependent on or connected with caturrh of the nose, the lachrymal sac and conjunctiva, and the plaryux; give rise to occasional bleeding, beadache, cerebral congestion, irritability, cough, parched mouth, thirst, with much drinking and consequent polyuria, laryugitis, ctinis. sometimes facial erysipelas, retard intellectual development, and produce the expression of stupidity common to all mouth-breathers. As the normal nose and naso-pharyux are full of microles, adenoid vegetations have been studied in reference to them. Streptococci, staphylococci, and pneumococci have been found on them, also leptothrix. Dienlafoy found tuberele bucilli in very many, and was disposed to claim the vegetations as tubercular; Gourc, however, not once in two hundred and thirteen cases, in thirty of which tuberculosiscould be found in other organs. Dientafoy's assumption is one of the many instances of the dangers, not of close investigation, but of premattire conclusions based upon the mere presence of actual or alleged characteristic microbes. Still, the surface on and mar adenoids is never normal, migrobic invasions are facilitated, the connection between the lymph-ducts and blood-vessels of the base of the cranium and the intracranial space is very direct, and many a meningitis would not exist if there were no adenoids. The same microbes have been found in both. Contraction of the nose, pointed arching of the palate, and dental deviations with shortened and low inferior maxilla, ill-shaped, particularly pigeon-breast, also scolosis, even funnel chest, are as much the results of adenoid vegetations as of original rhachitis or other (congenital) anomalies. F. Huber (Festschrift, 1000) reports that, " in a few cases of empyema in mouth-breathers, curetting of the naso-pharyax, by favoring pulmonary expansion through improvement in the breathing, caused the obliteration of a small cavity or sinus, thereby avoiding a secondary operation mon the costal walls. In the same way, the associated lateral curvature rapidly disappeared when usual respiration was established." He also emphasizes that "the teeth show a tendency to early decay, particularly the molars; in some cases stomatitis and gingivitis occur, persisting until the growths are removed." Habitual cold washing and friction of the whole body contribute to regulate the circulation and referr local hyperamia. Nasal irrigations with salt stater, boracic acid solutions, etc., while relieving the obstruction and catarrh of the naso-pharynx, are rapable of reducing congestion and sometimes render an operation superfluous. The latter, however, is preferable in almost every instance when the adenoids are not quite small, and just as important as the removal of intractable swelled lymph-bodies

from the neck. As the vegetations often spread over a large surface, instruments like Gottstein's, which remove the prominences from a large area, are best. Delstauche's modification of that instrument. which comists in the addition of two sharp books bent downward, is a good one and applicable to larger tumors which can be caught. The small ones should be rubbed off with Gottstein's seraper. The instrument should not be too large and not be carried sideways, in order not to injure the cartilinginous edge of the Eustachian tube. The operation should not be performed during an infectious fever, particularly not during an attack of diphtheria, for fear of further invasion through the sore surface; it is still more objectionable here than it is on the tonsils, which may require resection to facilitate respiration in an occasional boil case of diphtheria. During or immediately after the operation the head should have down to avoid bleeding into the air-passages. Bleeding will stop spontaneously, or by a brief compression with the finger, or an application of a spenge dipped in ice-water. If there he more, the pressing on of a spenge disped in a twenty- or forty-per-cent, solution of antipyrin in water is advisable. The operation requires amesthesia in very had cases only, but should be followed by a day's rest.

The connection of emersis with adenoids will be discussed in Chapter IX.

4. Congenital Fistula:

It is caused by the incompleteness of the closure of the second branchial arch. It begins near the sterm-cleido musele and terminates in the pharyux. Here it is either open (complete fistula) or not (incomplete). If open inside and closed in the middle, it forms a discerniculum. Cystic hygrometa, unless they be lymphangiomata or deep-scated atherematons costs, result from closure outside and aside while the centre remans open. Multilocular cysts may be the result of multiple and portial closure, perhaps by the rapidly proliferating epithelia separated from one another by copious lymph-tissue. The thyroglossel duct begins to undergo atrophy at the fifth week and is obliterated by the eighth, its upper extremity being penuanently indicated by the foramen creenin on the dorsum of the tongue. The fistein of the duct, when it does not close, is always in the median Sine, between the broad born and the stermus, and fined with citated columnar epithelium (in the lingual portion squamous). It moves with the byold bone. Injections of iodine have been made to close the fistula, and good results have been observed. Total extirpation is by far preferable.

D. THE (ESOPHAGUS,

Diseases of the mouth and pharynx descend into the orsophagus: catarrii, thrush, leptothrix, diphtheria. Injury by carbolic acid requires oil, also sodium sulphate in solution; by acids: chalk, sodium hierarbonate, soap; by lye: fruit-jurce, vinegar; by hot waterice or see-water and cold applications. The symptomatic treatment requires opintes.

Stricture may be congenital (Demme). Such a case, complicated with communication between the ensophagus and the trachus, was operated upon by Helferich with fatal result. Cases of complete atressa, with that of the anns, of the mitral and other critices, are on record. Stricture follows injuries (mechanical or chemical) after months or sometimes years. Above the stricture a diverticulum is apt to form, with the usual symptoms. Mechanical dilatation should be very gentle and gradual to avoid perioration; no metal instruments should be used. Gastrostomy, with or without dilatation or divulsion from below upward, is performed to facilitate both nutrition and dilatation from below. Hjort reports that he opened a stricture in a boy of fourteen years by electrolysis in two sessions, the negative pole of from ten to differen elements being introduced.

Foreign bodies should be extracted, if possible, according to the methods taught for adults. If that he impossible because of size or shape, they should be forced down into the stemach. If that fails, osophagotomy is indicated. Of the one hundred and twenty cases of ersophagotomy collected by Fischer, four were under two years, eleven from two to sen, four from ten to fifteen years, altogether with a mortality of thirty-three per cent., due more to delay, and consequent sepsis, than to the operation. Genster saved a boy of two years, in spite of deep ulceration caused by the foreign body, and a girl of nine years; Alexandroff, a boy of two years and nine months.⁸

Périaraphageal abacear may result from descending retro- or latero-pharyageal abaceas. Diseases of the vertebrae (the osophagus being in close contact with the cervical portion of the spine), of glands, pleara, and pericardium, also foreign bodies will cause it. Glands may be found transfied, the largus dislodged, and a soft swelling may be felt in the fauces. If it be within reach, an early incision should be made.

^{*} F. Karewski, Die Chirury, Kraukh, d. Krad, 1804, p. 277.

E. THE STOMACH.

2. General Nosology. Dyspepsia.

The indications for the therapeutics of the stomach, both dietetic and medicinal, are by no means simple and clear in every individual case; for it is difficult to make an exact diagnosis of the anatomcal condition of the surface and the tissue of the organ because of the frequent combination of various conditions. Indeed, the boundary line between a simple functional dyspensia and a gastric cataryle is perhaps never made out clearly. The epithelium of the muccusmembrane does not belong to it exclusively, but spreads in the contiguity of the tissue into the imciparons and the peptic glands. Thus the inflammatory condition of the surface becomes at once a "parenchymatous" affection, though it be possible that an uncomplicated catarrh and an uncomplicated inflammation should exist This, however, will last but a short time, and unless a gastric catarrit, or a dispensia, or an intestinal irritation-for the intestine shares the peculiar anatomical condition of the epithelium of the stomach -be relieved at once, the merely functional or superficial disorder becomes organic and deep-scated. These changes may refer either to the tissue or to the secretion. Inflammatory thickening, erosions, nicerations, or (Moncorpo) dilutation of the storach will be observed in a great many instances. The secretions become abusemail. The normal hydrochloric acid of the gastric juice is almost invariably diminished; now and then a case will be found, but in older children only, in which it is increased in quantity; still, as a rule, it is wanting or but scantily supplied. Lactic acid, however, is produced in much larger quantities than the first stage of normal digestion requires, and with it acetic, butteric, and the rost of the fat acids. With this variety of changes the indications for treatment go hand-in-hand; others are suggested by the multitude of etiological factors. The direct paralyzing influence of heat, the immediate effect of irritant and bulky ingesta, and the poisonous action of bacteria introduced in food and rapidly multiplying render the intelligent and effective treatment of many of the cases which occur in the peactice. of every medical man a matter of great difficulty and responsibility. Nothing is more common, but less appropriate, than routine treatment directed against a variety of cases.

The importance of diet in all questions connected with the pathology of the digestive organs justifies the repetition, in this place, of a few main points the elaboration of which may be found in the first chapter of this book.

The principal cause of the diseased conditions of the digestive argans of the young is to be sought for in improper food. Not even mother's milk will always agree with the baby; cow's milk cannot possibly take its place as a legitimate and satisfactory substitute. Mach less reliance can be placed on manufactured or home-made mixtures of unequal composition and doubtful quality. Children of more advanced years resemble adults in this, that they are endowed with more resistance to damaging influences; but the infant and young child are in constant danger of losing their physiological equilibrium by slight changes in feeding or by the deterioration of foods. The readiness with which milk, which is indispensable as a food, will decompose, acidulate, and become indigestible renders the greatest attention a necessity in the interest of prevention. The difficulties are very great; that is why it happens that an otherwise objectionable food (permissible so long as nothing absolutely good can be had) .that is, condensed milk,-when properly preserved and delivered daily at the dwellings of the poor, is preferable to food of a suspicious character. Attention must first be directed to the differences between cow's and woman's milk. The former contains more casein, usually a little less fat, sugar, and sodium chloride. Besides, the caseins of cow's and woman's milk differ both chemically and physiologically. That has always been so, and will be so, though a recent journal article declares the fact-or its assertion-a "bugbear." The former is less digestible, and its amount in the fixed given an infant must not be larger than one per cent,, rather smaller. On the other hand, a large percentage (from time to (welve) of fat is contained in every normal defecation of an infant fed on breast-milk; thus care should be taken not to exceed the quantity of fat contained in infant food when artificial feeding is resorted to. That is important because the fat of cow's milk differs both chemically and microscopically from that of woman's milk. Indeed, to what extent fat administered in excess, and indiscriminately, is and to produce diarrhoa is best illustrated by the "fat diarrines" which has been a frequent topic for disension in medical journals. Water, salt, and sugar must be furnished the infant in sufficient quantities. (See Chapter I.)

Water is often wanting in infants' and children's food, and its absence is the cause of dyspepsia and of anatomical changes in the digestive organs. Its olds in the organism is very manifold. Besides its influence on general metamorphosis, it is required to assist in pepsin digestion. In artificial digestion, albumin is liable to remain unchanged until large quantities of acidnlated water have been supplied. Peptones, even in the stomach, require water to facilitate their solution and absorption. The immediate relief felt from a draught of water taken iluring the precordial heaviness and discomfort experienced after a hearty meal is a matter of slaily experience. Infants and children—mainly the former—receive too little scater. Whenever they are thirsty, both in winter and in summer, they are given sulk,—that is, food; and many a case of dyspepsia, with its results, could be obviated by adding plenty of water to the food. Excess of water, if under ordinary circumstances there is such a thing, is attended by less inconvenience or danger, for it is readily absorbed and eliminated in the conditions it meets in the stomach, which holds salt and sugar.

Sodium chloride ought to be added to most foods of infants and children. For instance, vegetable diet contains more potassium and less softum than all the varieties of milk, and milk of herbivores more potassium than that of carnivores. Thus, cut's milk contains sodium t to potassium 0.76, woman's milk i to 1.13 or even 4.4, and sheep's and cow's milk 1 to 5.0. The amount of salt contained in woman's milk depends greatly on the presence of salt in her food. Therefore many a defective milk can be remedied by the mother or wet-nurse by adding salt to her food. Particularly is this necessary in dyspensia and gastric catarrh in the baby, one of the main symptoms of which is the presence of large and hard cords in the masses. brought up by vomiting or evacuated by the rectum. The addition of sodium chloride to mile impedes or delays the solid curelling by rennet,-a physiological fact which explains the usefulness of salt in every kind of infant food; for in vegetables, and mainly in farirarea, the disproportion of potassium and sodium is still more evident than in milks.

Souring of milk is prevented by boiling, mainly through the expulsion of a large quantity (three per cent.) of gases (carbonic acid, norogen, and oxygen) contained in the milk when it leaves the udder, and by the destruction of parasitic growths. That is why I have always advised to boil the milk destined for the use of a haby as soon as obtained, fill it hot into bottles, containing from three to six ounces, up to the corks, close them tightly, and preserve them inverted in a cool place. Whenever a neal is to be prepared, the milk thus preserved should be heated again up to or near the boiling point,—preferably in a water-bath. That process should be repeated perhaps several times a day; while one bottle is being heated, the others may undergo the same procedure, for every boiling interrupts the beginning of factic acid or other decomposition. The sterilization (or pasteurization) of milk in Soxhlet's apparatus is a still better procolure. Milk properly sterilized will keep one or more days, but for general use among those who cannot obtain (or pay for) the patented apparatus my method will suffice under ordinary circumstances and for people with the most ordinary intellect.

A certain amount of starch is digested at the very earliest age, for saliva is secreted at that time. Its effect persists in the stomach so long as the hydrochloric acid in the gastric secretion does not exceed cook per cent.; within the first half-hour of the digestive process there is none at all, but organic (mainly luctic) acid only. Thus, though starch pass the oral cavity rather quickly, it will still undergo its change into dextrin in the stomach. In many abnormal conditions this digestive change lasts a still longer time; for instance, in fevers, in severe gastric catarrh, and in dilatation of the stomach. These are the conditions in which faringceous foods are best tolerated, for the reasons that the diastatic effect of the salivais not disturbed, and that albuminoids cannot be digested became of the absence of hydrochloric acid (and pepsin). In all normal and many morbid conditions amylaceous foods, when present in certain quantities, have additional functions. Besides being nutritions in its our way, starch serves to dilute com's milk, to reduce the percentage of casein in the mixture, to prevent the latter from coagulating in large masses, and thus to render it more digostible. The reasons why I prefer in most instances either barley or oatmeal, and in others gum-arabic or gelatin, and do not recommend (p. 127) condensed milk, etc., have been given above. (See Chapter 1)

^{*}F. A. Hoffmann, in Lectures on General Therapeuties, Leopsic, 2d. ed., 1888, p. 223, says in connection with the rules on infant feeding annually published by the New York Health Department, which he copies, "Unless woman's milk can be lead there is a great danger in the probability that the sensitive intestinal tract by ougsted with injurious material; for each is the very best cow's milk in the cases of very young infams, because the mixture of its constituents differs greatly from that in woman's milk, and its casein is less digestible. Both physicians and pranufacturers have tried to compound substitutes for woman's milk, but those only the composition of which is known should be noticed by avantific men and recommended. An other reguisite is this, that such a food must be within the means and under slanding of everybody, and thin a certain expervision be possible. Incohi's treatise in Gerhard's Manual of Pediatrics will be found satisfactory by all these who desire to inform themselves on all that is known. From my own experience, I confirm his recommendations to dilute will, with burley- or outreal-water. At present the loope has been especised that all this may be replaced by the sterilization of wilk, but in gractice there will be many impediments and obstacles. Sterilization can have but one rough,-you to

From what I have said I draw the conclusion that so long as a baby is not mursed by a healthy woman, the opportunities for acquiring some kind of gastric disorder are very numerous indeed. Dynkerous is therefore quite frequent. Its treatment consists in more or less abstinance and in the regulation of the diet. As a rule, food should be more diluted than usually. As the gastric contents of infants who have been beought up on artificial foods are liable to be very ucid. alkalies in small doses, and frequently administered, have a good effect. Bismeth subcarbonate may be added. When there is vomiting, it must be determined whether it is gastric, and from what cause. Those who are in practice know soo well how often they have seen meningins mistaken for a gastric disorder, and how common is the occurrence of that symptom in the incipient stages of all kinds of inflammatory fevers. When all these and the local irritation of the stomach (brought on by foreign bodies, such as bulky foods, or by the presence of ascarides) and nephritis can be excluded, only then the vomiting should be considered gastric exclusively. Now and then abstinence only, or the drinking of warm water or warm mustard water to facilitate voniting; or alkalies (sodium bicarbonate, magnesia, calcium carbonate), or aficalies with bismuth; or resorcin to disinfect the contents; or dilute hydrochloric acid for disinfection and to correct the nature of the gastric ucid; or the washing out of the stomach with warm water or said water (6 or to to toto), or with a sodium bicarbounte (1 to tow or 200) or a resorcin (x to 50 or 100) solution; and, finally, after the stomach has been freed of its injurious contents, small doses of opinm, from one-half to one and a half milligrammes (one-one-hundred-andtwentieth to one-fortieth grain), every hour or every two hours, or its equivalent in morphine or codeins, will prove satisfactory. Protracted and obstinate vomiting I have seen getting well with minute doses of arsenous seid, from a thousandth to a four-hundredth part of a grain every hour or every two or three hours, according to the age of the patient or the individual indications of the case. Small doses of ice-water or, better still, ice-pills repeated every five or ten minutes will answer in many instances. Efforvescent drinks, iced, such as teaspoon doses of Apollinaris, Seltzer, or Vichy,

remove the danger arising from the decomposition of milk. But, after all, it is cow's milk and not woman's."

It is a source of gratification to the writer to learn that he has use been wrong to his practice and coaching. Bieders and Henberr also advicate the use of cereals:

or champague, may do fairly well in certain cases, but less frequently and less happily than in most adults under the same circumstances.

2. Acute Gastric Cataerh.

When it is produced by injurious ingesta, these ought to be removed. If vomiting have not occurred apontaneously, or not wefficiently, it should be produced by the above-mentioned drinks, tickling the fauces, friction of the precordial region, ipecae, the syrup is very often an unreliable preparation,-or other emetics. In cases of great urgency only the subcutaneous use of apomorphine may be resorted to. The mildest (and quite safe) way of emptying the stomach is by irrigation. Purgatives must not be given in the begiming; large menuta will act more favorably. They may consist of warm water, warm water with antispasmodics, such as assafurtida, or with stimulants, such as surpentine. After a day or two a purgative dose of calomel will answer. Fever, unless it he high, requires no special treatment; in urgent cases only antipyrin may be given, either by mouth or rectum or subcutaneously. Tendency to consulsions requires cold to the head or cold applications to the heart. which will reduce both the irritation of that organ and the temperature of the blood. A warm bath will often do good, but the customary bothing and jostling and tossing of a baby in convulsions do more harm than good. Thirst should be relieved by water, carbonic acid water, or water acidulated with dilute hydrochloric acid (1 to 300 or 500).

No solid food. Milk should be given in small quantities only, diluted with water, lime-water, barley-water, or on Rudisch's plan (dilute hydrochloric acid), water 250, milk 500). Vomiting is to be treated on the plan detailed above, predominance of acids by alkalies, constipation by calcined magnesia in small and frequent doses rather than by drastics. The aqueous tineture of rhubarb, in doses of from ten to thirty minims every few hours, will prove very satisfactory in many cases.

3. Gustritic.

Severe forms of guarritis—the corrosity, diphtheritic, and supporedity varieties—require cold applications to the epigastrium, and opium in the most available form; in the beginning, morphine subcutaneously. The corrosive form demands neutralization of the poison first: salt water for silver nitrate, diluted acids (vinegar) for lye, alkali (chalk, magnesia, baking-soda, soap) for acids, sodium sulphate or oil for carbolic acid, egg, water, and milk for corrosive sublimate, copper sulphate largely diluted for phosphorus, lime-water for exalic acid, freshle precipitated ferric hydrate for arsenic, etc. All of these require total abstinence, which may be continued for more or less time. How long it ought to be endured depends on the confition of the patient and the good judgment of the medical adviser. Adults will bear it many days and infants and children from twelve to thirty hours. If such absolute rest be demanded longer than this period, nutritive injectious into the rectum should take the place of feeding by the stomach. The rectum and the rest of the large intestine digest no albumin and emulsionize no fat, but they transform starch into dextrin and cane-sugar into grape-sugar; moreover, they absorb peptones of every kind, egg, emulsionized fat, and starch (p. 47) In all cases of rapid elimination of water by vomiting, or of atter exhaustion in gastro-intestinal catarrh with imminent thromboses in the small cerebral veins ("hydrencephaloid"), the hourly or twobourly injection of salt water (the usual strength) into the rectum in doses of an ounce or much more will fill the blood-vessels and restore circulation.

4 Chronic Gastrie Catorris.

It is sometimes dependent on or interrupted by acute catarrh, the attacks of the latter must therefore be promptly relieved. The several causes of chronic gastric catarrh have their own indications. Both in adults and children venous congestion resulting from pulmonary or cardiac diseases will give rise to it; thus in many cases digitalis in small doses, continued a long time, will be the remedy or one of the measures of relief. Sedentary life must be avoided, school hours and private lessons kept within reasonable limits, and regulated by the meals rather than that there should be controlled by the former. Masturbation must be watched: I have seen it to be the cause of gastric disturbances exactly as in adolescence. Diet and food want attention. Most children eat too much, and many too irregularly. Solid food is to be given but scantily; no sweets, no fat, which will cause hyperacidity, that must be presented or treated with alkalies Bee a gennine hyperchlorhydria (excessive formation of hydrochloric acid). Eating must be slow and matication careful. Toasted bread or stale wheat bread, milk dilmed with cereals or according to the muriatic acid plan (Rudisch), or peptonized (but not to bitterness), -everything of moderate temperature or lot, -will amover; in many cases small quantities of cold, fresh lattermilk. Slowness of digestion, with heavy sensation about the epigastrium, demands additional sodium chloride, sodium bicarbonate. effervescent alkaline drinks; fermentation indicates resorcin, or creosate in doses of from one-quarter to one-half of a drop. A few grains of salicylic acid diluted in large quantities of water () to 500 or 1000) may also be tried. Rhubarb and magnesia, rhubarh and sodium bicarhouste, tinctura rhei aquosa, render excellent service. When there is a great deal of mucus, dilute hydrochloric acid with small doses of pepsin are indicated. When the tongue is thirldy coated, with eractations, ammonium chloride (from half a gramme to one gramme daily) with tinctura rhei aquosa; the tendency to voma and to pain demands leamuth, in older children Carlsbad, Congress, or stronger (bitter) waters. Those measures may be continued for a long period; bismuth may be given indefinitely in small doses; zinc sulphate can be administered (doses from one-twenty-fifth to onesixteenth of a grain = two to four milligrammes every few hours) a long time, silver nitrate (doses of one-thirtieth or one-fifteenth of a grain = two or four milligrammes several times daily) for not nsire than a week in succession.

Occasionally irrigation of the stomach is resorted to with advantage, and may be repeated.

5. Dilutation of the Stomach. Stenoris of the Pylorus.

It is not very frequent in early infancy, but results from extension by gas (overfeeding with anylaces) under the influence of feeble museular development (congenital, rhachitis, amenia, parasyphilis) The treatment may include an occasional irrigation of the stomach, and must consist of appropriate diet. The same indications hold good in the older child, besides those which are furnished by the very extensive etiology. Dilatation of the stomach in the child is by no means rare. When met with in the adult, it dates often from (infancy or) childhood. Its causes are overfeeding in general and with annelaceous material in particular; rhachitis with consecutive imiscular debility; vorscity, imperfect digestion, and gas inflation; catarrhal inflammation with diminished absorption; general muscular memperency, as in amenia and convalescence; congenital imperfection or partial absence of muscular tissue in the wall of the stomach; paralysis of the storach, of central origin; hypertrophy and total to parrial obstruction of the pylorus; cicatrized afceration of the stonach near the pylorus, or of the duodenum; or peritoneal adhesions of the stomach resulting in a triangular or quadrangular shape of the diluted organ.

Dilatation of the stomach in the newly-horn or the very young infant is the result of stenosis of the pylorus, the normal diameter of which is at birth six and one-third millimetres, at the end of the first month seven millimetres, and one-third of a millimetre since with every month thereafter. The narrowing of the pylorus is either organic or functional. There is a congenital hypertrophy of the cireniar (in a case of Finkelstein the longitudinal) muscular layers of the pylorus (Hirschsprung, 1887); the dilatation of the storuch may be followed by that of the sesonbagus. Beath follows within a few weeks or months, and autopoies reveal the exact condition. Such cases require surgical interference. Such a enegenital hypertrophy may exist with all the symptoms of dilatation (even visible outlines of the descended lower curvature, and contractions of the stomach, vomiting, constitution mostly, etc.) without any spasm; but, on the contrary, it may safely be assumed that when there is originally a spasm, hypertrophy may be caused by it.

Such a congenital or infant spasm of the pylorus certainly exists. John Thomson, Plaundler, and others believe in a spastic condition of the pylorus as the came of its stenosis, that spasm being comparable with the tenesmus in anal fissure or ulceration, in vaginismus, or in higharospasm. That is why careful and scanty murition (rectal alimentation) and solutions (bellasloma, opiates) and warm fomes tations are expected to do good. When there is an excess of acid in the contents of the stomach, an occasional irrigation with sterile water or a slightly alkaline solution, and the administration of lime-water, calcium carbonate, or sodium bicarbonate is indicated. Nicoli and Meinland Schmidt report a case in which the stomach was opened and the pylorus dilated, with good results. In some cases of genuine primary hypertrophy gastro-enterostomy has been performed successfully.

In dilutation of the stomach of more advanced age antifermentatives should be given, such as bismuth, silver nitrate, calonel, or resorcia; all of these in small but long-continued doses. The quantity of food taken at one time should be small; the meals should be aumorous. Nothing should be given that is ant to ferment. like for and great quantities of starch; a certain amount is digested; when too slowly, taka-diastase may be tried. Large amounts of find should not be given. Milk in small quantities may be given often Diarrhea may require gallic acid and other astringents; it depends upon the condition of the stomach; indeed, most cases of consecutive diarrhea will be best treated by attending to the stomach. Raw beef is among those articles of food which are most easily digested, and beef peptones in small quantities are very useful. Raw milk is not so easily digested as boiled. Poptomized milk and Rudisch's preparation should be tried. A bandage should be worn about the abdomen. The faradic and galvanic currents can be used with advantage. According to Ewald, electricity and massage accelerate the passage of chyme into the intestine. It seems to me, however, that it is questionable whether digestion was improved by them, for it may be that both of these applications resulted in opening of the pylorus before the gastric digestion was finished. Einhorn's method of using the electric current in the interior of the stomach is hardly applicable to infants and children. Preparations of nux vomica—the fincture—or strychnine in three daily doses of from one-one-hundred-and-twentieth to one-sixtieth of a grain each (one-half to one milligramme) will improve the muscular tone of the stomach. When the dilatation of the stomach depends on adhesions, operative procedures may be considered.

6. Nercona Dyspepsia.

Its therapeutics must be simple; its effect is not very encouraging Food should be digestible and sufficiently copious. Purgatives should never be given; enemata must take their place, if required. Bitter tonics, country and sea air, cold bathing or sponge-baths, electricity, one large electrode being applied to the stomach and another to the spinal column, are indicated. In these cases, which are not quite tare among older children, particularly those with early and obstinate chorea and other symptoms of aniemia and "neurasthesia." mild preparations of iron and of arsenic are among the very best remedies, and should be continued a long time. Training, arsenic, and hydrotherapy will relieve many an obstinate case by improving general health and will-power.

Resentation (sucrycists) I have exclusively seen in neurotic individuals, mostly adolescents, all of whom were devoted masturbators. The only case I have seen in a boy of eight years was also that of a diligent tenanist. The food, mostly anyloceous, returns after every meal in instalments, until part of a meal or a whole meal comes up again; finally it stops, the last returns being acidulated. There is rather a pleasant sensation connected with it. Hyperacidity or anacidity has nothing to do with it. It has been observed in families, and small children of two years and over were affected. That would point to a neurotic tendency, or to a (atavistic?) peculiar condition of the stomach, which has been found to be divided into well-marked compartments. My own the apentical measures were directed against the detrimental habit and to invigoration.

7. Gastric and Duodenol Ulceration.

Withour without hemorrhage, gastric ofcer is not very uncommon in the newly-born, the infant, and particularly in children of from seven to thirteen years. Fatal hemorrhages, besides "melana peoratorum," have been observed, by me and others, even in infants. Nor is disodonal infer very rare. Of Collin's two hundred and seventynine cases, forty-two belong to the first decade of life, seventeen of them to the first year. It is not within a few days after birth, and probably depends not so much on intra-interine defect as on thronbosis of the umbilical vein and embolism of the vessels of the small intestine (Landau). Kinnicutt (Festschrift) emphasizes the causal effect of burns and of septicienia, and the common occurrence of complication with nephritis, the frequency of which in infancy and childhood, from all sorts of causes and with many complications. should always be remembered. Hemorrhage requires absolute rest in hed, ice-bug to the epigastrium, morphine under the skin in appropriate doses, ice-pills, figature of the lower extremities to compress veins for half an hour only; if tolerated, lead acetate may be given. No matter whether the cause be an embolic process, or a chronic catarrh of long standing, or a local injury (caustic or foreign bodies, stones, a safety-pin in a baby of eight mouths), the circulation in the parts is interrupted and the normal alkalinity of the tissues destroved. Thus these are constantly exposed to the injurious effects of the gastric acids, similarly to what occurs in the dead body when the action of the acids on the non-secreting gastric surface results in softening and perforation of the wall ("gastromalaria").

The first indication is to keep the Homogh and disafrance de alkaline as possible, at all events between meals. Now, the introduction of any food will give rise to the secretion of gastric juice, which is first lactic, afterwards hydrochloric acid; a certain amount of both is required for normal digestion. Whatever there is, however, in the stomach of acid or acids which are not required for the physiological process, particularly acetic, butyrise captylic, or only an excess of factic acid, must be neutralized. An occasional dose of an antacid is not sufficient for that purpose, but it must be given regularly and for a long time. I generally give the doses at intervals of two hours. I also give a dose a few minutes before each meal to neutralize every abnormal acid, no matter whether the patient is an adult or a child.

Which antacid is to be selected, the potassium, estimu, calcium, or magnesium salts? Of the latter, I prefer calcined magnesia to the

earbonate, to obviate the expulsion of free carbonic acid into the stomach. I use it frequently, but rarely (for a child) in larger doses than from eight to ten or twelve grains (0.75) daily. A small part of this, say one grain (0.06), is taken every hour or two, before meals, mostly in water, which should not be too cold; not water is even better. More than that quantity is seldom tolerated because of diarrhosa cansod by it; still, its purgative effect is very welcome in patients suffering from constitution; these may take larger doses. When the above quantity does not suffice to neutralize the acids, or it is feared that more magnesium may cause diarrhea, it may be combined with the carbonate or the phosphate of lime. Sodium bicarbonate does not take the place of the calcium and magnesium so readily, inasmuch as it also appears to promote the secretion of gastric juice. Therefore, in most cases, I use magnesium or calcium with or without bismuth subcarbonate, or such adjuvants, if any, as may appear to be indicated for other reasons: The addition of small doses of an obiate is indicated (only) when the intense motory action of the stomach is to be quieted.

This medicinal treatment must be continued for weeks or months; without it I do not see gastric or duodenal ulcers getting well.

The Carlsbud waters, and salines in general, owe their effect partly to their neutralizing and partly to their purgative influence.

The effect of ime-water is illusory, if given for the purpose of neutralizing the acid, unless in sufficient quantities; it contains only a single grain to nearly two fluidounces (50.0) of water. But when added to cow's milk in sufficient quantities (1 to 2 or 3) it certainly makes it more digestible.

The very function of the diseased organ involves danger. Both the storaich and the duodenum should be kept as idle as possible, and their labor should be made easy. Indigestible food must not be given and solid food must not be allowed. Most older children tolerate hoiled milk, strained outmeal, burley groel, stale wheat bread, and a few also raw beet. Some take nothing but boiled milk, or buttermilk, or koumiss. Many, particularly adolescents or adults, will tell you that they do not digest milk. That may be true; but then they gulped it down, and it formed in the stomach a large cheese-cake that was not afterwards dissolved and digested. They should hold their milk in the morning and heat it several times during the day almost to the holling point, or should pasteurize it for the day. They should add a small quantity of table salt, provided their stomach is not too acid, for the sodium chlotide may increase the gastric hydrochloric acid: also, in case the stomach is very acid, some sodium,

or calcium, or magnesium bicarbonate, and no salt. They should not drink their milk, but pour it into a plate and sip it with a spoon. Thus prepared, they will digest it, particularly when it is not quite cold. In fact, many require their meals warm or hot.

For the purpose of easier digestion, milk may be peptonized, or it may be rendered more digestible by the process recommended by J. Rudisch, or mixed with farinaceous decections as recommended above.

With an alkaline condition of the surface and an importors diet, the olders have an opportunity to heal. This may be aided by the administration of silver natrate. A child may take from one-thirtieth to one-twentieth of a grain (two to three milligrammes) in a tablespoonful of distilled water four or five times a day; it possible, on a fairly empty stomach. Or a smaller quantity may be given in a pill with or without a small done of opinm, say one-sixtieth to one-fifteenth of a grain (one to four milligrammes) in each pill. Sometimes I give but a single dose at bedtime in addition to the alkaline treatment. Silver nitrate must not be given beyond a reasonable time, to avoid argyria.

Tincture of tolline, in doses of from one to three drops for the adult, of one-half to one drop to a child, well diluted with water, has often been recommended. Its action is probably audifermentative here as in chronic gastric catarris.

When there are much pain and a great deal of acid or other secretion, opiates are indicated. Chloral is tolerated badly. Papain, which acts quite well in chronic gastric catarris, is not indicated in ofcer, hyperacidity, or in the presence of a neoplasm.

Operations recommended for gastric ulceration are, first, excision of the older; second, gastro-enterostomy, third, pyloroplasty; fourth; resection of the priorus; also cauterization of the ulcer and ligation of the bleeding vessels near the olderation. These methods are difficult, take time, and the operation must be performed on an exsangumated potient. Wittel, therefore, ligated the efferent blood vessels without opening the atomich (the right and left superior coronary arteries), with good result (Dentache Zeitsch, J. Chin., vol. Ixii.)

Bad cases require rest in bed, particularly those of anaemic guls (and women).

The stomach has a better opportunity to get well when at rest than when at work. Thus it sometimes becomes necessary to abstain altogether from feeding by the mouth. Rectal alimentation is then resorted to to great advantage. In conditions of such geneine starvation the lymphatics are very greedy and absorption from the rectum is very active.

Ulter of the stormelt, both in the young and old, being frequently associated with intense anienia, the result, in these as in many other cases, is mistaken for the cause. Then iron, the great presumed paracea for anienia, is often introduced into a storach which cannot digest it, and, in its attempts to do so, pain and inceration, with their dangers, are increased. One of the dangers is a cicatricial obstruction of the pylorus with dilatation of the storach.

Corrosone and surcount of the stomach are quite rare in infancy and childhood. There are but few cases on record. But as they are rarely suspected except in advanced age, and have occasionally burn overlooked in the adult, it is advisable to watch for them

F. INTESTINAL DISORDERS.

1. Constipution.

The catarrhal and inflammatory diseases of the mucous membrane of the intestinal tract have so many common anatomical and pathological features that, for practical reasons and to avoid repetition. I prefer to discuss them under the beads of their principal symptoms. Indeed, acute, subacute, and chronic catarrh (enteritis), cholera nostras, follicular enteritis, even membranous cutoritis, are, to a great extent, varieties of the same process, differing only in individual acuteness, or extension, or in its localization in the epithelium, muciparous follicles, or lymph-bodies, or in inservation, or in the amount of microbic infection, which as the intestine is relatively longer than in the adult, renders absorption of toxins much easier. That is why indican and acetone are readily found in the urine.

The main symptoms observed in diseases of the intestinal tract are constipation (less frequent) and diarrheea.

The therapeutics of countination depends on its chickey and its degree. In no case should the diagnosis be made without a thorough examination, which must in many be manual. The addomen may be painless, but it is mostly inflated. Faces come away in large lumps or in small and broken pieces. The liver and spices may be displaced, the former turned in such a way as to protrude its edge and posterior surface. The abdominal veins may be enlarged, the appetite diminished; counting is sometimes met with, occasionally also intervening attacks of diarrhora which are the result of the irritation produced by the hardened fecal masses contained in the colon.

An actual constitution should not be mistaken for an apparent one, which is observed in infants that have a small movement every two or three days only. The haby is emaciated, atrophic, not always fretful. In it the scantiness of defecation is the result of lack of food, and the alleged costiveness is speedily remedied by the furnishing of a sufficient quantity of appropriate nourishment.

Among the foremost causes of constipation is machanical obstewtion, brought on by cystic and other tumors, imperforation, bernia. (pervious or incarcerated), dilutation of the colon, congenital muscular incompetency (general or local), intussusception and twisting of the intestine, or by a peculiar condition of the sigmoid flexure described by me in the Journal of Obstetrics of 1869. Cases of constitution depending on the undue length of the descending colon and on the multiplicity of flexures which compress one another and thus obstruct the passage are quite numerous in every physician's practice. These cases of constigation are apt to last up to the sexth or seventh year and require constant attention, but medicinal treatment should be avoided, unless it be demanded by intestinal autoinfection. The faces may, in very lad cases, he so hardened and immovable as to necessitate their extraction from the rectum by means of the finger or a spoon. Now and then, in this, also in other varieties of constipation, the bard masses are felt in the abdomen, and have been mistaken for titmors. On no account should purgatives be given as a regular thing, but an enema should be administered daily for many years in succession. At the above-mentioned ages the relation of the several parts of the intestinal tract to one another becomes more normal, and the necessity for mechanical interference ceases accordingly.

An improper condition of food is a frequent cause of constipation. Excess of easein is relieved by diminishing its quantity, by replacing the milk of a cone by that of a wet-nurse, the white and heavy one of a wet-nurse by the thinner and more blaish one of another woman, or by reducing the amount of easein in artificial food to one per centor less. Besides, the milk thus reduced should be mixed with a glittinous (farinaceous) substance; oatmeal, to remedy constipation, is preferable to barley or any of the rest. Large amounts of starch must be avoided. Milk and artificial food will often lose their constipating effect by the addition of cane-augar. Babies at the breast are frequently cored of constipation by the administration of one or two teaspsonfuls or a tablespoonful of water, or continual-water, thoroughly sweetened, before each nursing.

Many preparations kindly supplied by the ever-watchful and immunitation trade contain large quantities of phosphates. They are apt to pass mostly into the intestine undissolved and unabsorbed. So will large doses of bismuth. Thus constitution may follow their use. The treatment of such a case is plainly indicated: likewise of those which are the direct result of the administration of astringents and opiates. The omission of such medication is the first condition of a cure.

The rise of temperature which occasionally accompanies innomplicated constipation, usually without a rise of the pulse (sometimes it is retarded), is seldom high. It is often referred by the hardened forces changing their place, always after evacuation of the bourds. If there be chills (rare), they mean sepsis and require active purgation.

Constitution is often dependent on the partial absence or the viscid condition of intestinal among. This is so in fevers, now and then in chronic enteritis (chronic intestinal catarrh), mainty of the lower bowels; also when there is too large a secretion from the skin and (see) kidneys, and when too little water is introduced into the circulation. I have repeatedly emphasized the fact that most infants are given less water than they require. In marelymous enteritis the large amounts of mucus discharged through many weeks or months, and sometimes years, are less frequently found in children than in hysterical (men or) women. That mnens is no longer viscid, but appears in the shape of membranes, sometimes in casts, and consods of nothing but mineus, with little pus, many leucocytes, and more or less traces of fibrin. In this condition also there is constitution, sometimes interrupted by diarrhoga; the discharges, hard or loose, may be quite frequent, however. Moderate cases, with muchs as the main part of the discharges, are called suscous esterible. Large injections of warm water with one or two per cent, of sodium hieuborate should be made daily, at least once daily. Now and then a mild purgative (easter oil) is advisable. But the condition which is mostly found in neurotic children, or such as belong to a neurotic family, will not be relieved except through persistent attempts at suproving the general condition by hydrotherapy and other general tonics. In a few cases occurring in more advanced years, to give the irritated, nervous colon a protracted rest, a right inguinal colostomy has been performed, with alleged recoveries. After a while the artificial anns was closed.

Incomplete peristalair resulting in costiveness may depend on a morbid condition of either the muscle, both of the intestine and the abdominal wall, or its innervation, like its reverse,—viz., excessive peristalsis or antiperistalair,—which are both of nervous origin (Gentavus Langmann, Festschrift 1). Early rhachitis shows its effect in producing muscular incompetency; bubies with regular exacuations after birth will become costive in their second and third months, and remain so although they are alleged to "look the picture of health." Not rarely rhachitis will make headway in muscles, epiphyses, and disphyses, even in cranial bones; at that time and afterwards, while the weight of the patient does not decrease, his skin feels soft and flabby, and the limbs and trunk are returnd though bleached. Indeed, there are many in whom constipation is the very first symptom of rhachitis. In all of them it is self-evident that constipution cannot be relieved permanently except by a thoroughly successful antirhachineal treatment. Sedentary habits of school-children have the same effect. in producing constigution. It is relieved by change of habit, plenty of physical exercise, and additional fruit diet, but purgative medicines, given persistently, render these cases worse. The binding effects of chronic peritonitis, either general or local, must, as a rule, not be comhated with purgatives; a snug bandage round the abdomen gives support and some to the bowels, and an enema, given every day for worths in succession, prevents accumulation and its consequences (dilutation, disorder of circulation, septic absorption). No massage. Universal emaciation and atrophy resulting in constipation have their own indications, and chronic cerebral disease (hydrocephalus) way require such local and medical treatment as has been detailed above.

in all forms of constitution in infants or children few inclicaments ought to be used. Honey, or sweet better, or a temporal of olive oil, given between meals, relieves many a case. An hobitual drink of cold water after rising may have the same effect. As there is so often an excess of acid in the gastric and even intestinal contents, calcased magnesia has its twofold indication. It may be given in many small doses or a single large one which need not exceed five or tengrains (0.3 or 0.6) a day. Doses of a grain se two grains may be continued for many days and repeated from three to six times daily Rlimbarb acts well when combined with it for the purpose of overcoming progracted costiveness. Rectal injections may be given from the fountain syringe, the nozale of which should be introduced beyond the two sphineters. In some cases it is desirable to introduce the instrument to a greater distance; an elastic cultitier attached to

^{*}Within B. Cannon (Amer. Jour. Physiol., vol. v. No. 3) proves that constinue may may the movements of the small and large insention) but that the colon (not the small intentions) has normally a period of periodics and outperiodics, such having five minutes, with a rest of five minutes, so that the whole process taken fifteen minutes.

the nearle may be used for that purpose, but the condition of the sigmoid flexure, detailed above, renders the introduction of the instrument beyond the very beginning of the sigmoid flexure a perfect illution in many cases. It happens quite often that an elastic or flexible tube, when introduced to or beyond the third aphinener, bends upon uself and reappears at the anns. To facilitate the entrance of the liquid into and beyond the sigmoid flexure the mjection should be made gently and slowly while the pelvis of the infant is raised. The nocele must be smooth and not thin.

To facilitate the downward movement of local masses and to simulate peristable, driction and kneading (massage) may be resorted to. Kneading must be performed with the palm of the hand, gently and persistently; or gentle thinsping with the closed hand and friction are best commenced on the right side and continued over the epigastrium and down the left side, in the course of the colon. Great caution and judgment must be used became of the frequency of local chronic peritonitis, which, when disturbed, causes subscrite or acute exacerbations.

Electricity has been used successfully when constipation was the result of insufficient peristales. E. Schillbach found that the several portions of the intestinal tract respond differently to the application of the faradic and galvanic currents.* The latter appears to have a stronger effect than the former. Local contractions result from the negative pole (cathode), peristaltic waves from the positive (anode). Thus, for the relief of chronic constitution depending upon incompetency of muscular action, the former ought to be applied to the interior of the rectum, the latter over the abdomen, along the colon.

In the cases of persistent constitution depending upon an insufficient immediar action of the intestine medication may now and then be required. I have treated a number of cases of the kind with nux and (or) physostigma, adding some purgative extract. A little boy with a decidedly rhachitical history (three years old) took three times a day a sixteenth of a grain (four milligranuses) of eachextract of nux vomica, extract of physostigma, and compound extract of coloranth—for many weeks in succession. But cases of the kind are, and should be, exceptional. As an occasional jurgative, for the purpose of relieving the intestinal tract of indigestible and injurious nusses, castor oil is probably the best and mildest: a few grains of calomel, or less, will act both as a purgative and an antifernmentative. Compound powder of lisorice will take the place of oil, when the latter is not tolerated or is objected to; also the fluid extract of rhamnics frangula or of rhamous purshiana.

Among the drastics, all of which are irritants, rhubarls and alsos are probably the mildest, and are tolerated a long time in succession. Of the salines, sodium chloride is the simplest. Its main action is osmotic; besides, it occasions thirst and thereby induces the ingustion of a large amount of water. The continued use, however, of salines irritates the nucous membranes. The combination of sodium sulphate with magnesium sulphate and sodium chloride has a milit and happy effect.

A frequent accompaniment of constipation is colic. Its causes are, scaides constitution, fermenting fixed, gastro-intestinal catarrh, the presence of ascarides in large numbers, reflex spasm produced by cold feet and chilled skin, diminished sonicity of the muscular layers of parts of the intestine (in general assertio and rhachitis during early infancy), wesenteric neuralgia (lead), and, finally, chronic performant, which results in adhesions or such local changes in the walls of the infesting as will produce local contractions or dilutations. There may be many cases in which a diagnosis is difficult, but there is no such thing as "pseudo-peritonitis." Thus, as the etiology of colic varies so much, the treatment must vary in order to be rational and effective and adapt itself to the cause. Its symptomatic treatment will often require either an enema or a purgative medicine, antiquamotics or sarcotics (assafortida, opium); they are apt to give speedy relief. Gentle Iniction of the abdomen, the application of dry hear (faund) but plate, hor sand-bag), the administration of hor aromatic teasfreshly prepared (fennel, anise, catrip, German chamomile), a few drops of essence of peppermint in a teaspoonful of hot trater, or the mjection into the rectum of large quantities of aromatic teas, at a temperature of 100° F or more, will do good; great care should be taken lest atmospheric air enter the howell

2. Diarrhya.

Diarrhora is always dependent on, or connected with serfacchanges of the intestinal muscus membranes, from simple cutarrit to olceration. Cazarrh may be localized, but is generally very extensive. It may descend from the stomach, ascend from the recum and colon, or originate in any part of the small intestines,

The treatment of diarrhead diseases depends in part on the locality, in part on the etiology of the individual affection. No "specific" treatment will ever do good, not even the modernized stomach-pump sticking contributly out of the coat-pocket of the delighted medical man.

who appears eagon to simulate the midurife of our mothers with the rectal syringe under her arm as her emblem.

The causes of diarrhea are various. A predisposition is produced by the incompetent or defective condition of the nuceus membrane in amenia of long duration, rhachitis, scrofula, etc. Food in improper quantity or quality, mostly unsuitable artificial food, is among the principal causes; but even mother's milk may give rise to it, as is proven by the fact that there are babies who, while falling sick at the breast of one woman, recover at that of another. Mothers who are sick or convalencing, or subject to very strong emotions, those who murse too often, who suffer from tuberculosis or syphilis, who are pregnant, some when they are menstruating, and all artemic persons secrete an improper trilk. The colostrom furnished immediately after childbirth is apt to give rise to diarrhea. Milk containing too much lat is the principal source of what has been described as "fat diarrhea," by German authors mostly; that containing salts in superalundance, mainly in anomia of the mother, is liable to produce the same effect.

The amount of food introduced may be too large either absolutely or relatively; the latter when the secretion of gastric fluids is insufficient, thus incilitating gastric fermentation in place of digestion; or when the flow and activity of pancreatic juice, limited at a very early age, is still more interfered with by a diseased condition of any hind and fever of any description.

The infant intestine is not controlled by emotional influences to the same extent as that of the adult; but local irritation is a frequent cause of diarrhosa, and the organ is very sensitive to the diminution or increase of atmospheric moisture and heat. It is quite probable that the overheating of the general surface affects the blood, the disolenum, and the general nervous system similarly (though not to the same extent and with the same enddenness) to what is observed after serious burns.

The mucous membrane with its lymph-vessels and follicles is easily irritated by such results and companions of fermentation as phenot, indol, skatol, and bacteria; by the alkaline salts formed through the frequent (normal and almormal) prevalence of acids in the upper part of the intestinal tract; by the direct influence of purgatives, occasionally by even the very smallest doses of arsenic and mercurials, though, indeed, the latter are tolerated very much better by the very young than by the adult; and by sudden exposure to a cold temperature. It is also liable to suffer long from the results of typhoid fever, dysentery, and occasionally from severe attacks of malaris. Protozou are stated by Quincke to be causes of chronic

diarrhora (Berl. N. Wook., 1890, No. 47); amorba coli is often found on alcerations.

Distributions of the circulation depending upon diseases of the liver, longs, or heart predispose to passive hypersemia of the intesting and to diarrhora. Indeed, when it does occur in these diseases, it is an eminous symptom. In no case of intestinal disease ought the diagnosis to be considered complete or a prognosis ventured upon tuless the liver, and particularly the heart, longs, and kidneys, have been examined with great care. Urasmia sometimes causes diarrhea without any apparent anatomical changes in the pale minous membrane, at other times with catarrhal ulcomous, or croupous changes depending—so part, at least—on the action of ammonium carbonate.

The variety of causes suggest a number of different treatments. Experters of circulation should be regulated while the local disease is attended to; ofcerations of the intestines are to be treated by some such method as has been suggested in previous remarks on dysentery; the skin, if there be fever, should be kept cool by luthing or sponging; the air-supply should be cool and plentiful.

Most cases of intestinal catarril (with or without gastric catarril) and diarrhox depend on the administration of improper food and the derangement produced by it. That should be changed immedialely. When the process of fermentation is still limited to, or going on in, the stomach, or the stomach still contains injurious masses, these ought to be brought up. In such a case the sound indigment of the practitioner must decide whether emesis is still useful or whether the stormels ought to be irrigated and washed our Most cases of "gastro-enteritis" are pre-eminently enteritis; there fore the assertion that the washing out of the stomach must not only take place in every case, but is the almost infallible remedy in the very worst class of cases, will have no other result than that of discrediting that useful procedure in those who are inclined to believe implicitly in the value of "new" methods and the pretentious claims of short-sighted enthusiasts. If we were to believe some of the loud talk of the journals, and the reporters' columns in the secular press gastro-investigal catarrh would soon be "one of the lost arts."

In fact, the injurious element is in most cases beyond the reach of the stomach-pump; indeed, the latter cannot remove anything but what is dissolved or suspended; the expulsion of large masses, such particularly, through an elastic catheter is not always possible.

The ville played by bacteria in the stomach and intestones is surely great; the class of the schizomycetes is numerously represented aliloin the healthy and the discussed intestine. Even within from four to eighteen boars after hirth there are large numbers of bacteria, cocci, bacilli subilies, and bacteria coli communia (Escherich) in the remnants of digested milk; the latter microbe in the large intestines. How many are introduced into the stomach immediately after hirth by the air swallowed by the newly-born cannot be determined. Besides those enumerated above, there is the bacterium lactis airogenes, which is credited with the decomposition of milk-sugar into lactic arid, carbonic acid, and hydrogen, thus giving rise to most of the gases constantly present within the intestinal tract.

The presence of immense quantities of micro-organisms, however, proves nothing in regard to the etiology of diseases, for they are found in the healthy state as well, as also in those morbid conditions in which the cause of death cannot be attributed to the presence of parasites or to the usual pathological changes. Thus, in arsenical poisoning the intestines are swarming with saprophytes-To what extent bacteria, and which of them, are the actual causes of diarrhoral diseases, and of which and of how many of them, is still debarable, in spite of Baginsky's and Booker's labors. During lactation, in the young child, the upper part of the small intestine holds hacterium lactis aërogenes, the fleum and colon bacterium coli commune. During the summer diarrheas both varieties increase in numbers and swarm over the whole intestine; therefore in neither of them is there anything specific se chologically suportant. In protracted cases of catarrhal enteritis leading to electation, according to W. Booker, streptococci are found in large numbers; in more than half the cases process vulgaris is found, mainly in the stormelt and the colon; the patrid odor appears to depend on its presence. Both these migrobes (mainly, however, the hacterium coli and the pneumococcus) may immigrate to the abdominal viscera, the lungs, the blood (not fragacutly), and the kidneys; thus, if they be causes of the original disease, establishing a local, distant (pronuncia, pephritis, pyelitis). or a general, constitutional malady (sepsis or furumenlosis) as consegnences. Or they are carried mechanically, causing phasyngitis, oticis, bronchitis, and broncho-pneumonia. To indgo from the undoubted occurrence of diarrheal diseases by contagion ascending through the antis (soiled diapers, fingers of nurses, contact in institutions), bacteria and their toxins must be credited with being more than companions,-that is, direct causes and sources of the local and general affections.

The different forms of distributed diseases are classed under dysentery by C. W. Duxal and V. H. Bassett. They say, "We believe our findings justify us in the conclusion that the summer distributes of infants are caused by intestinal infection with bacillus dysenteriae, Sluga, and therefore are etiologically identical with the acute bacillary dysentery of adults. The cases studied, from which the dysentery bacillus was isolated, include examples of so-called dyspeptic diarhosa, of enterocolitis, and of malautrition and marasmus with superimposed infection" (Amer. Medicine, September 13, 1902).

The intestine may be emptied either by purgatives or enemata; the former act upon the whole length of the intestine, the latter upon its lower portion. Castor oil, so common in domestic practice, deserves all the credit given to it. It acts mildly and speedily. The addition of opium is not wise; the latter may be administered after the former has exhibited its effect; the action of the oil must not be inhibited by the sedarive. In many cases a single dose of calomel (from one-half grain to six.) answers better, being both a purgative and an antifermentative.

The surplus acids of the stomach-mostly lactic, acetic, and butyric -must be neutralized by sufficiently protracted treatment. Magnesimm and sodium salts must not be selected for that purpose, for they add to the diarrhos. Calcium salts, the carbonate or phosphate. are preferable because they have no such effect, but the additional advantage of forming with the fat acid an insoluble salt which acts as a protection to the sore surface. Doses of about one or two grains (0.05 or 0.1) may be given every hour or two. Besides being an antifermentative in general bismuth (the subcarbonate) binds hydrogen sulphide, and thus has a favorable effect in frequent doses of from a quarter of a grain to two grains or more. They may be adminotered with or without the addition of opium. If they be given to liquid form, no syrups should be added to correct the taste, but rather glycerin, which has the advantage of not turning sour. The subgallate is credited with a still more constinating action and the salicylate with additional antiseptic effect. It is not an well tolerated as the subcarbonate.

To combat the existing fermentation, antifermentatives may be given at regular intervals. Calomel, bismoth, alcohol, crossote, estimm salicylate, salol, naphtalin, resorein, mercuric bichloride, and othershove been subgired. To take effect in the intestine, it appears that those which are not readily soluble in the storach ought to prove more useful. Still, I feel positive that resorein in doses of from a quarter to one-half of a gram (0.015 to 0.03) in solution, or as a constituent of a powder containing bismuth, chalk, or (am) opinion, given every two licurs, has rendered me the most valuable services in a great many cases. Of the two mercurials I prefer calomed in far,

in doses of from a twentieth to a quarter of a grain (three to fifteen milligrammes) every few hours. The antifermentative effect of alcohol in the dilution in which we are estitled to give it as a stimulant, though the sum total of a shilly dose may be large now and then, is not great; sodium salicylate is less effective than any of the rest, creosote acts more vigorously in the stomach than in the bowels, salol is readily taken; naphtalin is objectionable to many because of itstaste and odor.

Opium, by its inhibitory effect on reflexes, diminishes hyperarsthesia, hyperperistalsis, and hypersecretion. The objections to its me in certain conditions in the diarrhoral discuses are theoretical only. Doses of from one-tenth to one-third of a grain (six to twenty milligrammes) of Dover's powder every two hours, in all sorts of combinations, act very well indeed, and may be considered indispensable when the above indications are to be fulfilled; but its time has mostly arrived only when the odor of the evacuation begins to be normal. That is why Vaughan and McClymonds (Festschrift) advise against the use of opium in cases of bacterium coli poisoning; they have observed that the condition got worse rather than better after its use. For that reason opium should be deferred until the alimentary canal has expelled its highly irritant poison. It is contained within the factorial cell. That is why the bowels in their normal condition may carry intold undelivered facteria coli without harm; that is also why the path of the practitioner is beset with so many difficulties in forming his eticlogical diagnosis and his therapeutical indications. For, indeed, there are cases of "follicular enteritis" of a chronic nature, with malodorous discharges for weeks in succession, in which opium is not contraindicated. Bad ofor and toxic infection are not identical

In neutr cases, and when the stomach participates in the process, astringents, such as lead, tamin, gallic acid, alum, etc., are badly borne. In chronic protracted cases they will find their indication. Silver nitrate does better in many cases, from one-fiftieth to one-thirtieth of a grain (one to two milligrammes) in two drachms of distilled water (dark bottle) every two hours. In chronic cases only, coto, from half a minim to a minim of the fluid extract, will sometimes act favorably. Tannalbin, in daily doses of from four to fifteen grains (0.25 to 1.0) or more, as a powder or in minimums, is among those modern medicines which are highly recommended (mainly for affections of the lower bowels) by some observers, too highly by manufacturers. Biodern recommends tannigen when the discharges are alkaline, tannalbin when they are acid.

Of the stimulants, alcohol may be admixed with food. Bad brandy or whiskey contains finel cel, which is a paralyzing agent. Whiskey is therefore preferable in America, because it can be obtained in greater purity for less money. It must not be administered unless diluted. Camples is better borne than ammonium. It is easily taken when simply rubbed off with glycerin and suspended in mucilage (from one-fourth to two grains every one or two hours). The strongest nerve-stimulant of all is mask. Urgent cases of colleges require one or two grains (0.06 or 0.125) every fifteen or thirty minutes (best suspended in mucilage) until six or twelve grains have been taken. A very good stimulant in collapse is the injection into the bowels, through a good-sized flexible tube (catheter No. 12, English) of hos water with not more than five per cent, of alcohol and one or a few drops of tincture of opium. In threatening cases of heart-failure strong coffee, hot or lood according to circumstances, by itself or in mixtures, may be used to advantage by mouth; hot in the rectum; or a subcutaneous injection of sodio-caffeine benzoate or salicylate, a few grains in the double quantity of water (1 to 2) repeatedly. Cold ten may be tried in small doses, particularly in the chronic cases of older children.

In acute cases of intestinal (or gastro-intestinal) catarrh with high temperature, applications of water of from 60° to 70° F, to the abdomen will render good service. The cloth must be wrong out thoroughly, covered with rubber cloth and flamel, and changed when warm. Amenic children and those with much pain require warm or hot applications, which may be preceded by a warm bath. Frequent injections of water of 100° F or more, with or without an antifermentative, such as thymol (1 to 1000 or 2000), answer well in most cases, not alone in rectal catarrh. In great debility or collapse the mater ought to be from 105" to 112" F., and contain some alcohol. and opium or (and) a teaspoonful of the tineture of mask. The addition of grm-arabic to the insection, or the use of glutinous decoctions (flaxseeft) instead of water has a satisfactory influence. Starch injections have the advantage of adding to the nutrition of the body by the facility with which the colon changes amylum into dextritt. which will be absorbed. Part of the injected water will always be absorbed; fill the Islood-vessels, and may prevent intracranial and other thromboses. Indeed, in many had cases in which the cerebral symptoms of the so-called hydrencephaloid condition have made thrir appearance, or are imminent, frequent injections into the rectum of a few onices of warm fluid contribute considerable in the restoration of circulation.

In hot weather doors and windows should be kept open and the coolest place selected in the house or neighborhood, day or night; for night air is preferable to no, or foul, air; and sea air or country air, particularly at some altitude, is superior to city air. When in hot weather the body feels hot, it should be washed with cold or cool water, or water and alcohol (5 to 1), frequently. Cold feet must be warmed by flannels, hot stones, hot sand- or water-bags, and gentle friction, and well covered.

The food supply must depend on the condition of the stomach and of the upper part of the intestine, and also on the rapidity of the peristaltic action of the latter. The complication of gastritis with enteritis contraindicates the introduction of food altogether. Abstitute is better in cases of intense vomiting than the use of we; the latter may quiet the stomach for a while and feel pleasant, but it fills the stomach, which ought to remain at absolute rest, and excites peristalsis. Babies with an irritated stomach tolerate abstinence better than urgests. The ubiquitous berf-tea ought to be avoided; its concentration of salts is irritating. If in convalescence it be given at all, it should be mixed largely with burley-water or rice-water.

In all cases of "summer" diarrhox milk must be avoided. Box cases forbid raw milk, boiled milk, milk in any and every shape, for days and longer. Its rapid fermentation contraindicates the smallest quantities, even in farinaceous mixtures. The absence of gastric juice. (pensin and hydrochloric acid) in the stomach of a feverish child or of one that is being drained of its fluids prevents the digestion of albuminoids. Even mother's milk is often not borne to any extent. When milk is again tried after a while, it ought to be done very carefully: cou's milk thoroughly boiled, or sterilized with six times its column of barley water at first, the percentage of milk to be increased slowly. I repeat: cow's milk, ever so often holled or sterilized, is still onw's milk. Milk may be replaced by the white of egg, which should be thoroughly mixed with barley-water, some salt added, and not more (cane-) sugar than is required to make the mixture palatable. During the course of a day and night the whites of from one to five eggs may be given according to the case and age. Severe vomiting and diarrhora demand, as suggested, total abstractice for from two to eight hours or more. Afterwards, mucilaginous or farinaceous decoctions may be given in small doses at short intervals. A mixture which has rendered me very valuable services in the woest cases of vomiting and diarrhesa, after the period of absolute abstinence was terminated, is about as follows: five ounces (150.0) of burles mater, the white of one egg, from our to two trasposalelsof brandy or whiskey, some sait and cane-sugar; a trasposmful every five, ten, or twenty minutes according to circumstances. Muttonbroth may be added to the above mixture, or it may be given by itself, with the white of egg and a little salt.

3. Tumefaction of the Mesenteric Lymph-Rodies.

It is of frequent occurrence. Its results are very serious, though the non-absorption of chyle does not depend exclusively on the functional incompetency of the lymph-bodies. Simple inflammatory hyperplasia of the lymph-hodies can be more safely prevented than cured. Its original cause is mostly a diarrises of some form or another. The irritation of a mucous membrane leads always to that of the neighboring lemph-bodies; thus a nasal catarrh, a stomatitis, a diphtheritic process, a pulmonary entarth, produce secondary adenitis, and the mesenteric glands near an intestinal catarris are stoncongested and begin to swell. Cell-proliferation accompanies the changed circulation; when its original cause-viz., the hyperemia of the muccus membrane-has ceased, absorption of the newly deposited material will always take place in the same way that the swelling of the plands of the neck will disappear when a mosal catarrh is treated with cleansing and disinfecting irrigations or injections. As soon, however, as the newly formed cells have been transformed into firm fibrous tissue, the possibility of absorption becomes less from day to day. Thus, the prevention of mesenteric glandular hyperplasia consists in the immediate removal of a diarrhora. Be it ever so mild, it. is always a morbid process. Be its name ever so innocent (for instance, "dental"), and the prejudice in favor of letting it alone ever to strong, it leads to anatomical changes which may become pennament in the mucous membrane and the glands. When a diarrhees has been protracted, it may safely be assumed that the lymph-bodies necessarily undergo chronic changes. Then the camious administration of an iodide, preferally sodimu, is indicated, in daily doses of from five to fifteen grains (0.5 to 1.0), according to the age of the nations, the severity of the case, and the probable duration of the persons. It should be continued for weeks, and may then be replaced by three daily doses of from five to twelve minims of the symp of the indide of iron. When no indide is tolerated, it may be substituted by iodipin (containing ten per cent. of iodine), of which from onehalf to one teaspoonful may be given daily, in emulsion; for inunction, one part of iodipin with three of vasogen, or with two of landin and one of vaseline. Morbid processes of any kind in neighboring

organs may cause glandular swelling. Adenoma of the liver in a garl of twelve led to (not adenomateus, but simply hyperplastic) numerization of the periportal lymph-bodies and to a very rapid development of ascites (Tranz. Azarc. Ant. Phys., 1807).

Primary inhercalization of the mesenteric glands is quite rare: so is primary tuberculosis of the intestine, in spite of the fact that meat (very rarely) and milk containing the bacillus are known to be the occasional cause of tuberenfosis of the bowels. Both are, as a rule, though by no means always, the results, or complications, of general tuberculosis, and in this way they, and tubercular peritonitis also, are not uncommon. Thus, the treatment of inbercular tumefaction of the mesenteric glands forms part of the measures undertaken for the relief of the symptoms of the general infection, and leaves but little hope. But there are cases in which the tubercular nature of the swelling cannot be doubted, that nevertheless get well There are now on record a number of cases of peritoncal tuberculosis in which laparotomy was performed, either through a mistalou diagnosis or purposely, and the lymph-nodes were found numerous and greatly enlarged, that recovered. Thus, even such cases afford no reason to pronounce a fatal prognosis.

The conditions alluded to must not be mistaken for truncfaction of the mesenteric lymph-bodies from other causes (for instance, primary lymphoma, the glandular enlargement of leucocythaenia or syphilis, or sarcoma which occurs primarily, or from carcinoma which is occasionally met with secondarily in young or older children). Lymphoma and sarcoma are positively improved by the protracted use of arsenic in increasing doses, such as are discussed on page tao, Syphilitic swellings require the persistent administration of active doses of both mercurials and londers.

4. Appendicitis.

It is a very frequent disease in childhood, and much more so than acute colitis or typhhitis not artended by an affection of the appendix. There are, it appears, anatomical reasons for it. The appendix of the newly-born is one-tenth of the length of the colon, that of the adult one-twentieth (Ribbert). It continues to grow (Sokolow) to the thirteenth year, remains stationary until the twentieth, and then undergoes atrophy, so that at fifty its width is less than at birth. In the young its contents may be expelled by its contraction (Klebs), or are retained in the focus and in children with flabby intestines, and give rise to colic when the mucous membrane is thickened. Appendicitis from this cause must be frequent at that age. There is, busides,

much folliculitis in the soung (rare after thirty years); that is why gangrene is frequent in early life. Absolute rest and very careful observation of the patient by a competent person are required. Even in the mildest cases the patient must use the bedpan and urinal, and under no circumstances be permitted to change his position unaided. The disturbance of an incipient peritoritis by mechanical causes is a serious matter; recent adhesions are very liable to be torn and give rise to new attacks. No purgatives must be given except a dose of oil in those rare cases in which no evacuation has taken place for some time, and when the accumulation of large quantities of faces in the colon is certain or considered probable. In these cases, however, a large enema of soap and water given at once will mostly fulfil all the indications. Thus, I am not at all prepared to advise, with a few modern authors, to commence the treatment of appendicitis (and peritonitis in general) with magnesium sulphate or a large dose of caloniel. The injection, however, first of a few ounces of olive oil, and afterwards of large quantities of soap and water, through a fountain syringe, is again indicated after a week or ten thys. No stomach washing, no puneturing to establish a fragnosis. Opium must be given freely by the month, rectum, or subcutaneously, in full doses, but discontinued, or its doses reduced, when there is tympanites. In almost every case ice applications should be made for days to the right hypochendrium, and warm applications after many days when the fever subsides. The food must be liquid and given in small quantities at a time. The patient must remain in a recumbent posture for weeks after apparent recovery, and be kept quiet even then, for an abscess may be capsulated and perforation may occur. If after a few days the fever increase and there he more explate, the operation should not be deferred. If the mild symptoms remain unchanged for eight or twelve days, the operation should be performed.

A positive diagnosis should be made early. Frequent previous pain in the same locality and intestinal disorders accompanying it, or a similar attack which occurred months ago, a very sudden careal pain (McBurney's point) with somiting (or urithout) a few histers or days ago, and illness with fever, perhaps the presence already of slight swelling, and the raising of the whole right lower extremity by the unaided patient, while lying on his back (Meltaer), leave but little doubt. In many cases the locality of the pain is not conclusive; it may begin on the left side, or in the transverse colon. When the diagnosis of appendicities is established, to say, with a modern author (Tyson), that the surgeon should be called in a decide on the time of operation is rather rash. Of Bierner's one hundred and twelve hospital cases of all ages not operated upon, between the years 1874 and 1889, ninety-eight left well and nine "relieved." Relapses took place in seventeen of which two died. In five many recurrences took place. These figures are very favorable, —too favorable, in my experience,—though the course is apt to be milder in children than in adults. Hawkins reports on two hundred and sixty-four cases with a mortality of fourteen per cent.; of those which terminated in abscess twenty-six per cent. died, of those with peritonitis seventy-five per cent. But even the complication with general peritonitis need not be despaired of. R. Abbe (Med. News, May 29, 1897) concludes from a large array of such cases, his own included, that "the earlier the operation the better the prognosis;" but "there still remains a chance for life if the period clapsing be not more than two and one-half days."

In many acute cases with violent symptoms a timely operation alone will save the patient. To establish the indications for surgical interference in these cases is, however, rather difficult. Pulse, temperature, local pain (with or without pressure), and swelling require close watching. If the pulse goes up to from 120 to 140 and stays there, if after five or six days there he no improvement in the general symptoms, in the fever and swelling (or either of them), or if the temperature of the body, after decreasing, rise again, I consider the indication for operation very urgent. A general rule, however, cannot be established.

The indications for the time at which the operation is to be performed are not always easily found. Indeed, opinions still vary with reliable authors and surgeous-a great many of whom, in all comtries, have given the very closest attention and the very best thought to the subject-as to the proper time at which the operation ought to be resorted to. Some recommend and practise the operation as soon as perforation of the sermiform process has taken place, some favor prograstination until the beginning of the second week. Besides, there are those who object to any operation when universal peritoritis has set in, and those who perform laparotomy - the same class of cases. In a number of instances the time of the operation depends on the condition of the patient; immediately after the perforation of the gut collapse is sometimes so great as to render surgical interference absolutely inadvisable. In these ice, opium, and stimulants are required to bridge over the imminent danger until the operation can safely be performed. I have seen such cases in which it was considered positively fatal at first, and proved successful

a week afterwards. There is no class of cases in which the responsibility of the medical man is greater and full knowledge and keen judgment are more urgently demanded. Not every case terminates in supplication. In some there is a great deal of inflammatory exudation. In them the protracted use of potassium or sodium iodide, lanolin ointments of the same, and occasional vesicatories will render good service. I have known many who had repeated attacks extending over years, and finally got practically well.

Still, there remain the results of the inflammation,-cicatrication, shrinking, adhesions, and the constant danger of a relapse. If those dicatrices and the appendix were removed, how much safer it would he! The responsibility of advising an operation for the perpose of removing the appendix of those who have suffered from repeated attacks in the intervals is great, that of not advising it is very much greater. Of thirteen children of Broca operated on for that purpose after recovery from one of the attacks,-that is, elective treatment hetween attacks,--all got well. Of seventy-two operations during the attacks, however, thirty-five per cent. died; of five children whose appendix was removed during the operation for an acute attack, three died. Somenburg lost one case in one hundred and seventy-nine interval operations. Kümmel none in one hundred and four, and the experience of all our American operators is equally favorable. The practice of performing interval operations is becoming more and more rational and successful.

The indication for the operation in acute cases and the selection of the time for its performance are, perhaps, apt to be influenced by the observation—in New York City—of two facts: first, no matter what its unknown cause or causes may be, appendicitis is becoming more and more frequent; secondly, it is becoming more septic. In emergency cases, in the hands of the most skilled operators, many cases have died of sepais soon after the operation, though it was not much delayed. That observation is liable to encourage the very earliest interference in acute cases.

After recovery, purgatives must not be given for a long time; has, as a matter of precaution, warm enemata should be administered every day.

5. Paratyphlitis.

This name refers to local inflammation, exadation, and supportion which have nothing to do with the vermiform process, but with the copious connective tissue between the bones of the privis and the colon, which at that place is not covered by peritoneum.

Such abscesses are sometimes the result of trauma; not infre-

quently of pelvic abscess; of inflammation of the psoas; of caries of the vertebrar; sometimes no cause can be found, oven after it terminates in recovery. They will develop rapidly and some become very large. Sometimes pints or quarts of pas will either be discharged spontaneously or be removed by incision. Still, it is not always suppuration that results from the inflammatory process in the connective tissue, but exadation and thickening only. When these happen, the treatment consists in the internal use of the iodides and the applications of continents of iodoform or iodide and lanolin, or of iodoform collodion (1 to 8 or 10) several times daily; cold-mater applications which are kept up until they become warm; or sometimes warm positices, particularly in the cases of very aniemic children.

6. Intuemeerption.

Twenty-five per cent, of all the cases of invagination or intusousception of the bowels occur in the first half-year of life (two-thirds of them between the fourth and sixth months) and fifty-three per cent, before the end of the first year." Thus, a knowledge both of the condition and the means to remedy it is essential to the family physician. The only successful treatment consists in the reposition of the intestine. When it has been accomplished the relief obtained is numediate. The vomiting, anxious expression, pallor, and collapse improve instantly, the little patient goes to sleep, and soon takes food. In the commencement of my practice, when an invagination extended down to the rectum I employed large sounds for the purpose of reducing the invaginated mass, but I have almost invariably found the case to be worse afterwards, because the sound will crowd the parts upon one another. I also used to blow air into the intestine through a long tube by means of bellows; and in order to make the supply more regular I availed myself, forty or more years ago, of an apparatus for the production of carbonic acid gas. After that time, when the siphons with carbonic acid and mineral waters were invented, I used them for the purpose of filling the intestine more or less slowly with both gas and water. All these measures have proved successful in occasional cases. What has rendered me better service, however, is the following simple plan. The baby is turned on its belly, the hips are raised, and the abdomen gently supported by a soft pillow. The mouth and mose, being the lowest parts of the body, must be protected. The baby is amenthetized with chloroform, and warm water is poured into the rectum with but little pressure, not from a beight of " four-

^{*} See up Interinal Distance, p. 242

teen feet." This is important, for the intestine is no iron pipe subject to the laws of hydrostatics only. The injection is frequently intermitted, while the arms is closed by the finger. At the same time the abdomen, in the direction from below upward, is gently kneaded and its contents moved about.

In not a few cases in the course of the last twenty or thirty years. I have seen immediate result from this treatment. When reduction has been completed, the buby must be kept absolutely quiet, take opium, now and then a restal injection of chloral in solution, and wear an abdominal bandage just tight enough to steady the bowels. Relapses are not at all uncommon; probably it was a case of frequently relapsing increasusception in which Knaggs operated after forty-four days (London Loncet, April 24, 1891).

In adults, Kussmanl reports favorable results from washing out the stomach. When the simple measure which I propose is unsuccessful after a number of trials, laparotomy should be performed. The successful cases of laparotomy are becoming more immerous, sufficiently so to justify the operation as the only means that promises a favorable result in irreducible cases. The late Henry B, Sands was one of the first who saved a body of six months by this operation; at present the number of reported (and not reported) cases, both successful and unsuccessful, is very great. The latter should not count to the same degree as the former. All those who were saved by the operation would have died without it. Pitts (London Lencet, June 12, 1897) saved six out of seven consecutive cases. It is necessary to operate in time; for at best, laparotomy, in these cases, has its serious difficulties, and prolonged abdominal manipulations are not borne by infants.

At an early period all the tissues involved are hyperamic and soft, with a tendency towards gangrene. In a child of eight weeks, on whom I operated, it took me ten minutes to separate the parts from one another, although I had the invagination, measuring six or seven inches, outside of the abdominal cavity. This delay was due to the softness of the tissues, the close impaction of the three layers, and the presence of a large amount of mesentery in the mass. Besides, the field of operation is very small and the difficulty of returning the intestine into the abdominal cavity very great.

7. Helminthes.

The medicines available for dislodging intestinal worms are all strongly trotant. They must not be given unless the diagnosis has been made positive. It is better that the diagnosis of a gastritis. enteritis, or meningitis, when present, should be made by the medical man than that the child should be pureshed for his carelessness or ignorance. Before taking anything to expel tarnir, a child ought to be in fair general condition. Moreover, its own tarnis, the medicancillate, is the most difficult to dislodge. The best time is when proglottides are seen in the movements. Moderate abstinence for tlays, at least for one day, and a purgative (castor oil) ought to precede the administration of drugs. The parasite must be expelled; for though the symptoms may not be urgent, some day there will come either local or reflex disorders, possibly attended by danger.

Spontaneous emigration will be noticed occasionally, but it should not be waited for. After the successful termination of the treatment the intestine should be allowed to rest. The plainest diet, such as milk, strained farinacea, and peptones, is indicated for days

I have administered a great deal of kamala, sometimes from ten to fifteen grammes (a quarter to one-half of an ounce), during one hour, early in the morning; the breakfast (milk) to be postponed for two hours. The effect was not uniform and often negative. It was improved by giving a dose of from twenty-five centigrammes to one-half gramme (four to eight grains) four or five times daily, for ten days or more, previous to the larger dose. A few hours after the larger dose castor oil ought to be given.

Kouso, from four to fifteen grammes within two hours after the required preparation, to a child of from two to ten years.

Ethereal extract of fills may has proved most successful in my hands. A small-child may take one gramme (fifteen grains) in an aromatic mixture, or in one or more capsules, within one early morning hour. Four grammes are tolerated and required by a child of seven or eight years. The oleoresina aspidii of the Pharmacoperia seems to act differently when purchased at different places. As the whole procedure of expelling a ternia is no trifle, it is worth while to be very careful in the preparation selected.

Pelletierin tannate is given in doses of one or three decigrammes (one and a half or five grains). I have but little experience with it. It is obtained from cortex punion granatum, which was (and is still) given as a decortion, but is too disagreeable and sometimes dangerous a mess for a child or infant.

For the removal of ascaria some general preliminary treatment like the above should precede medication; at least, the bowels ought to be moved gently. The powdered semina cynze (santonicze), or flores cinz, one gramme (fifteen grains) or more, mixed with a syrup, and followed by castor oil, will work well, but is very unpalatable. Santonin, which is obtained from it, works as well and more pleasantly; from one to sex centigrammes (one-sixth to one-half or one grain) several times a day, with a purgative such as magnesia, coloned, or julip. The latter addition is desirable, inasmuch as now and then poisonous symptoms may appear. Older children will complain of "xanthopsia," yellow vision. Sometimes the urine and conjunctive are yellow.

As the acyuric remiculariz (pin-worm) is frequently found in the rectum or its neighborhood, the internal administration of drugs will not relieve the local itching. Vaginal catarrix, resulting from the immigration of the worm, must be treated locally. The worm is removed by a small piece of blue ointment introduced into the rectum, or by rectal injections of rinegar and water (1 to 1 or 4), of corrosive sublimate (1 to 1500 or 6000), or of decoctions of onions or garlic. It is difficult to dislodge, as it originally inhabits the colon and even the small intestine, and is within reach only after descending into the rectum. The rectal catarrh and tenesious are best treated with warm brigations of saline solution, or of starch-water, or of hismath subcarbonate suspended in water or starch-water.

Antitylostome devidence has attracted a great deal of attention of late, and may become of more practical importance to us when the numerous blessings of emigration from the parts where the worm is indigenous go on as hitherto.

The male is from six to ten, the female from ten to eighteen, millimetres in length (one-third to one-half inch). The mouth is bellshaped, there are two dental prominences above and four below-Particularly the female is thus characteristically endowed, so that it sucks and littes at the same time. Eggs, smaller than those of ascaris, are found in the faces of the patient. The parasite is found in large numbers among the Italian workmen of the St. Gotthard tunnel, the tile laborers of the Rhenish provinces, and the Hungarian miners and their children. The causes of its presence are the muldy water they drink, which is filled with the ova, and the clay they work in, which contains the larvae. We now find it in the United States, mostly in the emigrant population. The general symptoms are very severe and dangerous,-debility, pallor, utter exhaustion like that of pernicious antenia, and relative diminution of red blood-cells. This "Egyptian chlorosis" was explained by Griesinger, by the presence of anchylostoma, as early as 1854. Besides, there are pain in the epigastrium, constipation, mucous and bloody discharges, sometimes real hemorrhages and dysmnea.

Anchylostoma disolenale requires santonia, thymol (adults should

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take from two to ten grammes daily), and principally extract of filts sens. It would not enter the digestive organs if the water were boiled and filtered before drinking. Auguillula intestinalis is often found in its company and probably adds to its dangers.

8. Umbilical Hornia

It is of very frequent occurrence in the infant, but seldom attended by danger. Incarceration takes place very rarely; still, Treves and many others have reported successful operations for such accidents. As there is a predisposition to the development of this variety of bernia, so there is a tendency towards spontaneous recovery. The nund umbilical aperture will normally change after a number of trouths, or even a year, into a narrow fissure, more fat will develop, the muscles will become stronger, and then the intestine will be retained within the abdominal cavity. To accomplish this still more certainty, it is desirable to retain the contents of the hernial sac inside the abdomen. For this purpose the common forms of trusses are unatualing. Strips of adhesive plaster serve very much better, but in most cases they are objectionable because they irritate the sensitive skin of the hally. An adhesive plaster ("Dieterich's"), containing from tento twenty per cent, of zinc, does not irritate and answers the purpose.

Whatever application is made to the hernta directly must be larger than the aperture. It should not be too hard. Linen compresses and those of woven int, plates of cork covered with linen or lint, may be applied and hald in position by means of a handage. A knitted one will sait better than the ordinary one of linen, cotton, or flamel.

q. Inguinal Hermit.

In the newly-born or the very young it is apt to disappear spontaneously; when, however, it depends on or is complicated with phimosis, circumcision should be performed to prevent the straining caused by it. Constipation must be overcome. When the short and straight inguinal canal becomes, in the course of a few years, longer and more oblique and the amount of fat goes on increasing, the rupture may disappear; but all these predisposing factors never succeeded in effecting a cure by themselves. This is accomplished only when the herma is retained inside the abdominal cavity completely and constantly by means of a truss, which must be worn for years. It must not be removed except when the haby is sleeping quietly. Trusses are micromfortable in the beginning, and give rise to cutaneous irritation, particularly under the influence of urine. So much the more is it recessary to keep the truss clean, and always to select one which fits

exactly without exerting too much pressure. If these mechanical means do not effect a cure after a few years, or when parts of the contents prove irreducible, the radical operation (Bassini, Kocher) or a new procedure devised by George R. Fowler, which consists in intraperitoneal displacement of the spermatic cord and obliteration of the internal ring and inguinal canal (N. F. Polyctosic, July 15, 1897), will save the patient much discondort and remove the danger of a possible strangulation. A similar operation is recommended by Nélaton and Ombréville (Lyon Mid., August 1, 1897). Launelongue's method of injecting zinc chloride solutions into the tissue should be recommended as little as the same method applied to tuberculous joints or to spondylitis.

Hernia is easily reduced into the abdominal eavity, in most instances, by gentle pressure while the legs are taised, sometimes best in a warm bath or under the influence of an amesthetic; but there are on record quite a number of cases in which incarceration and strangulation required operative interference. The operation should not be delayed after reduction, under the influence of an angesthetic, has proved impossible. The mortality after the operation does not seem to be greater in children or infants than in adults. An instance of a successful operation on a case of strangulated feworal bernia, which occurred in a girl of cleven years, has been reported by St. German, also by Dowd (Arch, Ped., May, 1897) and others. Rees encoseded in reducing an inguinal hernia by aspirating from the intestine a quantity of mrbid liquid. An exceptional procedure of the kind, however, must not be recommended for general adoption. If strangulation is old, taxis should not be attempted; the less so, as the last few years have proved the almost uniform success of the operation.

to. Colorrà of the Rection.

It behaves very often like a merely local disease. Indeed, it may occur as the result of a local irritation of the anns (scratching, sitting on mindly stoops), of oxyuris, of foreign bodies, or of hardened faces. The immigration of factoria through the anns was discussed above (p. 347). In all these cases the treatment should be directed to the cause, which must be removed. Warm injections of water, faxseed tea, or starch decoction (with a little opium in tenesimus) are sufficient. Real proctitis, leading to alceration (other than dysenteric) or fibrous hyperplasia, is an infrequent result. But it may occur; the infiltration may become copious and lead to an invasion of the surrounding cellular tissue. This periprectific gives rise to abscesses, and often to fismula, either external or internal, complete or incomplete. These, as well

as the periprocritic abscesses due to pyarmin, to sepsis, or to the severe form of typhoid fever, require an early and large incision and careful antiseptic after-treatment:

11. Prolapse of the Anns and Rectum.

It is the consequence of caturrhal and inflammatory irrelation and softening. It may follow chronic catarrh and dysentery. It is produced by debility of the splineter, which is often congenital, or sometimes the result of neighboring diseases; also the to drastic purgatives, or to constipation with the incidental straining; it first appears as a mere extropion of the mucous membrane. Straining, resulting in prolapsus, is also produced by the presence of polypus or worms in the rectum, by stone and catarrh of the bladder, and by phimosis. A predisposition arises from the peculiar shape of the rectum in the young. It is straighter, inasmuch as the sacrom is not so concave as it is in the adult.

The temporary reduction of the prolapse is readily accomplished, particularly in those many cases in which the splineter is feeble, but the intestine will come down again. Attention must be paid to defection. The children should not be allowed to strain. Thus the chamber, if any be used, should be placed in such a position, and russed to such an extent, that the feet cannot touch the floor, or the child must not be permitted to sit up during defectation.

Many applications have been devised to retain the recrum inside. Adhesive plaster has been used as best it could be, and a number of instruments have been invented for the purpose of retaining the recrum in position, while leaving an opening for the passage of the faces. They have been made of hard rubber, lead, and other materials. Some have used a tempon and others a compress to hold the rates together; but a tampon will certainly dilate the paralyzed sphincter more than it was before. Curling confines his efforts to compressing the nates.

The main attention should be paid to the treatment of constipation or diarrhox, local catarrit, rectal worms, polypi, stone in the bladder,

[&]quot;Hippocraces makes the following remarks on this subject: "In children suffering from state, and protracted generic dynastery, the return is apt to protraile. It should be pressed in with a soft sponge, and touched with a small. Then the patient should have his hands tied, and be suspended a short time, and thus the recrum will slip in. If it comes down again, a burst should be placed around the loins; a bandage must be attached to this, and the recrum, after being muistered with a decoction of fotos, be replaced with a soft sponge. Also, the intestine must be washed with this decoction and the hundage carried to between the legs to the mubilion. During defecution the buby must six with enlanded legs upon the feet of the mother, its body learning against her knees."

phinoses, and all the causes of straining and prolapse which have been enumerated above.

But there are direct indications. Astringents have been used locally in the form of injections; principally alium and tamin, in solutions of one or two per cent. Ice has been applied locally, and injections of from half an ounce to an ounce of ice-water may be used with advantage three or four times a day.

One enema must be given daily for the purpose of emptying the bowel and thus avoiding the possible straining.

In most cases there is considerable swelling, sometimes real hypertrophy of the mucous membrane and of all the tissues. Swelling and hypertrophy must be reduced. A part of the hypertrophied tissues has been excised. Caustics have been used; for instance, other nitrate. It should be carefully neutralized immediately after the application by sodium chloride in solution. Concentrated natric acid has been employed for the purpose of destroying some of the superfluous tissue. The best remedy, however, for this purpose is the actual cautery. It should be applied either in long wells or strips or at half a dozen or a dozen points. It matters not whether the galvano-cautery, or Paquelin's thermo-cautery, or the common actual cautery is selected.

For the purpose of strengthening the sphincler, I have used frequently, for dozens of years, an ointment consisting of extract of max somica, one part in ten or fifteen parts of fat, to be applied to the lower part of the rectum from three to five times a day, or every time the bowel protrudes. The internal administration of stryclinine is of very little avail, but that of ergot is serviceable. The infentaneous injection of stryclinine (sulphate, from one-sixtieth to one-thirtieth grain dissolved in water, once daily) in the neighborhood of the sphincler is beneficial, particularly when supported by the action of the interrupted electric current, which may be applied for a few minutes once or twice every day. Rational treatment is required for the constitutional causes of debility and emiciation (rhachitis, tuberculosis).

12. Figure of the Anna.

It is by no means rare in infants and children, particularly in the faiter. It gives rise to symptoms similar to those encountered in adults; severe pain during defecation, tenesmus, dysuria. Many cases of alleged flatulency and colic, and exerneiating screaming spells, are due to fissure. The more severe form follows a direct injury by foreign bodies, hard faces, etc.; a mild form is due to slight crossors and ulcerations, the rhagades of congenital or acquired syphilis, or the sores made by crytherm, eczema, or herpes, and by valvo-" vaginitis."

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The mildest form is that which is found on a very loose and dilatable anns. This yields readily to a mild local treatment of the sore with a solution of silver nitrate (1 to 250 or 500). Cases depending on syphilis require both general and local treatment; vaginal catarrh (colpitis, not "vaginitis") must be stopped and ecoesia healed.

The treatment of the severe form has consisted in the relief of occasional diarrhug, and that of the more frequent constinution by enemata and mild purgatives; in the application of astringents, such as lead, copper, zinc, or alum; or of causties, such as the solid silver mitrate (Esmarch) or nitric acid. This treatment is painful and tedious. Boyer advised incision through the whole of the splingters. The open wound, however, which is kept clean with difficulty, may bleed and give rise to illocration or sepsis. The proper treatment comsists in dilatation of the sphincters. Josseline directs it to be gradual, thereby protracting uncertainty and pain. The best and speediest method, however, is foreible and instantaneous dilutation, without or with anosthesia. The operation takes so little time that it is hardly required, except in very puny or convalsive infants or children. The introduction of two fingers of the same hand is rarely sufficient; three or four do better, or the thumbs of both hands. The easiest way is to use the two index-fingers for pulling; a sufficient dilatation is recognized by the distinct sensation that the muscular fibres have given way. The external wound is triffing and but superficial. There is rarely any bleeding, which will stop under the application of ice or a sterile tampon. Two or three warm rectal injections of salt water or starch-water should be made daily for some time.

In the rare cases of festure and polypus combined the treatment must be directed to both.

13. Polypus of the Rectum.

They are tumors from the size of a pea up to that of a cherry or hazel-nut, or more. They are single or numerous, quite soft, or more frequently of greater consistency, composed mostly of cells or cellular tisspe, quite vascular, and contain often a harder adenomatous nucleus and a Lieberkülm gland subsedded in them. They are either pedanculated or sessile, on a broad base. They are often found in many members of a family, and (F. Huber) frequently connected with adenoids of the naso-pharynx. They are sometimes found between the two sphineters, mostly above and near the inner sphineter; not infrequently, however, all over the middle portion of the rectum, sometimes quite near the "third sphineter," and very rarely in the execum (Vajda in Islate). J. Kinderk., vol. 1.)

Among the symptoms we occasionally meet with abnormal defecation (constipation, diarrhica, or both in alternation), sometimes with enteralgia or tenesimes, and frequently a discharge of mucus or of blood. Tenesimes is found about polypi when seated near the internal sphincter or between the two sphincters. Blood is seldom mixed with inners, mostly quite clear, from half a teaspoonful to a teaspoonful, sometimes more, so that the constant repetition of these small humorrhages is sufficient to result in anaronia, but also to establish the diagnosis. The timor is often pushed into or through the arms during the eracustion of the bowels.

The treatment consists in the removal of the tumor by means of the cold source by the galvano-caustic source, by pincers or the fingers, or by ligature. The latter is easy of application in all cases in which every movement of the bowels results in rolling out the growth like a foreign body. In these many excursions a polypus with a thin asslicle is often removed spontaneously. When that occurs there is bardly a show of blood. Indeed, there is seldom much bleefing after removal. It is true that some writers report the occurrence of hemorrhages; but in infants and children, with whom varicosities of the blood-vessels are exceedingly rare. I have never som a hemorrhage of any account after breaking the pedicle with my finger in the recture. The latter is very accessible indeed to an index-finger of moderate stre.

Sessile polypi do not give rise to urgent symptoms, and sometimes are not easy to find. The astringent injections which are to remove them should be mild. Solutions of one per cent, of alimi, injected several times daily, will be found sufficient, or a two-per-cent, tentment, or a suppository. Ead eases require the speculum and scraping, with an antipyrin solution of fifteen or forty per cent, or the actual cautery to stop bleeding.

G. THE LIVER.

The diagnoses of alleged diseases of the liver are more numerous than its diseases. Primary affections are rare. Enlargement is frequently assumed to exist when the size is normal. In the forms and infant the liver is proportionately large. At two weeks of age (Birch-Hirschfeld) it amounts to 4,2 per cent. of the body weight, at six months to 6,1 per cent., at one year to 5,8 per cent., at two years to 4,3 per cent., at three years to 4,7 per cent., at four years to 4,8 per cent., at five years to 4 per cent., at six years to 3,5 per cent., at nine years to 4,4 per cent., at ten years to 3,2 per cent. at twelve years to 3,8 per cent. Thus there is a gradual dimination, with bet few exceptions. Its

size in the very young appears still larger because its lower part is not covered by the ribs (which in the young are placed more horicontally) as it is in the adult. Besides, the tyronanitic intestinesencroaching upon the liver from below and behind, and the rhachitical contraction of the chest-wall, if present, render a much larger surface of the organ accessible to percussion and palpation. Thus, actual and primary enlargement is not a common occurrence. Secondary calargement, however, may depend on constitutional-either chronic or acute-disorders, such as alcoholism, syphilis, lencocythamia, chronic tuberculosis, suppuration of bones or glands (amyloid degeneration, together with that of the spleen and of the kidneys), malaria, or typhoid fever. The therapeutics of these kinds of enlargement. depends, therefore, on the character of the different causes. A case of multiple adenoma of the liver in a girl of twelve years was published by me in the Trans. Assoc. Am. Phys., 1867. Enlargement of the fiver should not be diagnosticated when the organ is merely dislodged downward (floating liver, hepatoptous). It may be primary, or secondary to emphysema of the lungs, rhachitis of the chest, etc. In very rare cases its position may be so changed that the diaphragmatic surface looks outward, to the right side. Ptosis requires proper support by an abdominal bandage, or by strapping with broad adhesive strips (Achilles Rose).

Another series of enlargements is that which results from changes in the circulation. Diaphragmatic pleurisy of the right side may constrict the yeng cava inferior and thereby lead to hypertrophy of the liver, ascites, anasarca of the lower extremities, and death. Pneumonia in its acute stage impedes the bepatic circulation, temporarily mostly; when it is chronic, the consecutive hyperamia may lead to hypertrophy; the same effect may be produced by the persistence of plental effusions on either side. Persistent obstruction of bile-ducts may have the same effect. More frequent yet is the secondary herotic enlargement of heart disease, not so much in the congenital form. in which the amount of blood is greatly reduced by the low state of general nutrition, as in acquired (mostly rheumatic) endocarditis, but much more so in acute and chronic myocarditis. Indeed, rapid swelling of the liver will confirm the diagnosis of cardiac disease in the muocardium. A chronic perihepatitis with a thick and extensire exudate ("Zuckerguss") depending on pericarditis or right side pleuritis was described by Curschmann. It is independent of changes in the liver. A congenital induration of the liver, independent, however, of periheratic alterations, and due to portal changes, was described by Pick. Pericardial obliteration is frequent in both forms.

The number of such cases increases with every year of life; undeed, children of eight or ten years with chronic valvular diseases and consecutive enlargement of the liver are frequently observed. Myocardial alterations are also very frequent. Thus, the treatment of hepatic disorders is that of the primary disease rather than of the secondary changes.

Fatty infiltration of the liver is, in the very young, not often complicated with much increase in size; for to a certain extent it is normal. But, in ill sutrition, protracted diarrhosa, to which the tendency is greater on account of the absence of antiscptic property of the (otherwise copious) bile in the young, chronic pulmonary tuterculosis, and after severe cases of dightheria or scarlatina, or in alcoholism and acute moningitis, an actual fatty degeneration is looke to occur, with enlargement of the organ. Dead foundlings are reported with futty liver in forty-one per cent, of the cases. Sometimes it is found combined with interstitial inflammation (circlosis), particularly in cases of syphilis, rhachitis, tuberculosis, or after measles or scarlet lever. All of these facts are here alluded to in order to show that the intellectual physician may accomplish a great deal by attending to an evil before it is developed. Nothing is easier and more luckless than to prescribe iodides, caloniel, or surgatives for an established local disorder, and fold the hands at the sight of an imposshilling nothing more efficient and happy than to watch and treat in time rhachitis and measles and scariatina and the whole army of primary ailments. Obuta principiir. Noiseless prevention counts more than the loud officiousness of the recipe fiend after the avil has been permitted to advance to maturity.

Besides the cirrhotic induration of the liver complicated with fatty infiltration, there are instances of genuine cases of cirrhotic, mostly connected with, or depending on, cardiac disease (myocarditis mostly), parenchumatous inflammatory disease of the liver, alcoholism, syphilis, rhachitis, acute exanthemata (measles, scarlatina), and tuberculosis, also arsenic or phosphorus poisoning. Thus it is either circulatory or toxic. Od microbes, Charin found bacillus pyseyaneus, Weaver bacillus coli. Hektoen bacillus coli and pseudoliphtherie. Plexner found toxalbumins of different origins. According to all these observers, cirrhotis of the liver destroys the vital capacity of the organ, so that microbes are no longer annihilated by it. Adami found bacillus coli alive in the diseased liver, dead in the normal. The atrophic form is rare and mostly due to syphilis; the hypertrophic, with more or loss jamsdice and only a mild degree of splenic enlargement, is more frequent. Still, both forms may develop in the course of the

same process, the atrophic being the last development of the hypertrophic form. Pigneratory circlessis of the liver (and paneress) is sometimes a symptom of harmatochromatosis connected with (bronzed) dialettes. Cirrhous of the liver is by no means so rare as it was bebeved to be before attention was paid to it. It took a long time before a lumdred cases were enumerated in literature. That has changed Gilbert and Fournier (Sem. Mid., 1895, p. 248) published six cases of from five to eleven years. There was immifice in all, the spleens were large in some cases larger than the liver, the last phalanges of fingers and toes were enlarged, the nails curved, the ends of femora, tibia, and fibula enlarged, many joints painful, and there was synovial effusion in the knees. All the children were undersized and puny. Ascitesis not so frequent in the young as it is in the adult; it is more often observed as the result of chronic peritonitis than of cirrhosis, and of portal obstruction of any kind. The energetic suppression of the alcohol habit (more frequently found in children and adolescents than many presume) and the treatment of syphilis (not always hereditary) may result in recovery. Ascites gets well sometimes after a single paracentesis. Mercury and iodides are very effective, not alone in syphilitic cases. In every sort of cases, and at every age, I have succeeded in relieving cirrhosis, and sometimes permanently, by alternating, by the week or fortnight, the administration of iodides (potassimi or sodium, iodipin) and mercury (bichforide or the green iodide, and sometimes calomel). The bourds should be kept open with salines. (sodium or magnesium sulphate), and diuresis improved. It is true that, as a rule, organized exudates will not melt and become absorbed when old, but recent cell proliferations submit to medicinal interference. Collateral circulation has been established for the purpose of draining the liver and re-establishing local circulation. The liver, splees, and peritoneum were actively rubbed in order to cause an inflammation, successfully in a few cases. Forty years ago I injected tincture of todine into the abdominal cavity of an alcoholic cirrhotic of fifty years after having been obliged to tap a dozen times at short intervals. The result was a formidable peritoritis and no more ascites for about four more years, when he died of senile general degeneration and a moderate attack of ascites.

The therapeuties of congestion of the liver is that of its causes, viz. the lungs and heart, phosphorus poisoning, infectious fevers, or very high temperatures. While nothing is more preposterous than the abuse of antipyretics in the presence of moderate temperatures, nothing is more reprehensible than to allow paralysis of blood-vessels and even thaintegration of tissues to take place from excessive pyrexia. The

same is true of hepatic information and an physician. In our country the former, when general, is mostly transmatic, the latter the result of facillus coll infection, pyzemia, umbilical phlebinis, dysentery, perityphlitis, and pleuritis, besides an occasional case produced by pylephlehitis, or the immogration of an ascaris, or a contusion. Many a case of abserss need not have occurred if the desenteric rectum had been disinfected by frequent enemata, a peritypolitic or pleural abscess been incised to time, and the umbilical philebitis of the newly-born prevented by keeping the cord ascutic. Multiple abscesses will always terminate fatally; a single abscess may get well by either aspiration or acision and drainage. Of the two I prefer the latter, though, indeed. I have seen a successful result from a single aspiration followed by antiseptic irrigation. 'The diagnosis of hepatic abscess from subdiaphragmanic abserss may become difficult. It is not very rare; in one hundred and seventy-six cases collected by Lanz twelve occurred in children. Intestinal disease very often precedes in. The skin is sensitive, the pain radiating, the liver and heart are not disledged, the dulness is most marked over the sixth rib behind and the third and fourth riles in front, the long being normal above it. The paneture should be made during expiration (Fürbringer).

Acute pellow atrophy has been observed in infants of from one month to fourteen years. Greves (Livery, Med Surg, Journ., July, 1884) collected seventeen cases. I have seen but two, with pain, voniting, joundice, neptiritis, lever, and early brain symptoms. They all die, mostly within a week.

The treatment of jaundice depends on its causes. The dangerous form met with in the septic newly-born might have been prevented, but cannot be cured. That which results from syphilinic stricture of the bile-ducts may recover, even after months, through a thorough mercurial treatment; complete obliteration of the bile-ducts leaves no hope, except in those cases which can be proved to be inflammatory. In them persistent alternation of mercury and iodides may relieve, or restore fiealth. With mercury alone, aided by but little potassium iodisle in the rectum, a child of ten years with large and hard five-(probably fatty, previously) got well of icterus which lasted five months and was complicated with secondary sephratis. The mild form depending on the sudden postnatal change in the hepatic circulation corrects itself; that which follows a gastric and dooderal catarrh in the newlyborn, the infant (rarely), or the child will get well with proper diet and medicines, which have to be adapted both to individuality and age. As a rule, the amount of food ought to be diminished, but little meat (chicken) permitted, and milk and faringeeous foods perferred. Alkaline waters (Seltzer, Vichy, Waukesha, Poland), sedium bicarbonate or phosphate, bismuth, hydrochloric acid, resorcin, and calomel will be found appropriate in a great many cases; in others, conious cool enemata or tinctura thei aquosa. Jaunifice attributed to the influence of foods, localities, mixers, and atmorpheric influences has been observed to occur epidemically. J. M. Da Costa (Amer. Jour. Med. Sci., August, 1800) published a case of typhoid cholecystitis which occurred in a girl of eight years, with pain, vomiting, and jaundice. Ice, afterwards warmth, and the subcutaneous use of morphine relieved her. Such cases require, besides the treatment outlined above, rest in bed, warm bothing, and disphoretics. H. Pietzer (Seventh Ann. Rep. Health Dep., Bremen) reports an extensive epidemic, not contagious, after revaccination. The glycerin lymph (humanized) which was employed was all obtained through different agents from Eastern Prussia. Jaunslice from gall-stones, though it has been observed in the very young, even in the newly-horn, is excessively rare. The rules for both dietetic and medicinal treatment of biliary calculi must be the same at all periods of life. Strictly nitrogenous food should be avoided or taken in small quantities only, and milk and fruit. (oranges, grapes) and fresh vegetables permitted. Of all the medicinal agents known to me, sedium sulphate and salicylate, administered for months in succession, have answered best to guard against a repetition of the attacks.

Baccelli's method of operation in echisococcus of the liver consists. in aspiration thirty enbic centimetres (one onice) of the figure through a thin aseptic trocar and injecting twenty cubic centimetres of a oneper-mille solution of corrosive sublimate. The puncture is then covered with game and adhesive plaster. In a few days the sac begins to diminish, and finally contracts. I, you Bokay published three successful cases (Arch. f. Kind., 1807, p. 310). The cases are rare. but may occur in everybody's practice. Cruveilhier saw one in an infant of twelve days. Finsen reported twenty-one cases between ten and fifteen years in a total number of two hundred and fortyfive. The methods of operation have been puncture, puncture and injection of iodine preparations, puncture and drainage, simple incisions, the use of caustics followed later by incision, and two incisions, the second to be made after adhesion between the liver or sac and the peritoneum has been established. This method is the safest by far.

Concer (mostly scirthous) of the liver is rare. A case was observed at birth by Noeggerath and one by me. Twenty-one cases have been collected in early life. It may begin as an adenoma, with rapid growth, tumor of the spleen, ascites, and hemorrhages. No treatment yet beyond that looking for enthanasia.

H. PERITONITIS.

Whether acute, subacute, or chronic, it is a frequent occurrence at any age and quite common in the young. The several forms will interchange and combine or alternate with one another; the chronic variety may remain dormant through an indefinite period, and suddenly break out with full force. All the forms of septic and infectious diseases give rise to it, from the sepsis of the newly-born to scarlatina, erysinelas, variola, dysentery, and typhoid fever (much more frequently without than with perforation). Trauma and perforation from any source, straining and contusion, indigestion, diarrives, and constitution (less frequently in the young than in the adult) will lead to it. Diarrhosa is a frequent cause of local peritonitis, the process penetrating the thickness of the intestine. Local disintegration of the serous membrane, possible with unexpected perforation during any period of later life, may be its result. The same is observed as the result of a healed typhoid alceration. Inflammatory processes in the neighborhood, such as plearitis, or simply local irritation from incipient herria or retained testicle, are among the frequent causes. Perhaps the most common origin is that from a previous attack which occurred at a period ever so distant. After all that has been said in these beief lines, it is easy to see to what extent preventive treatment may prove effective. The watching and mitigation of an infections disease with a typical course, the spendy disinfection of the intertimes in typhoid fever and dysentery, the prevention or cure of chronic constitution or diarrhers, the peoper attendance on appendicitis and plearitis, the application of a truss and alleviation of the dangers of a strangulated testicle, are just so many safeguards against attacks of peritonitis.

When an acute attack of pentonitis, either local or general has made its appearance, absolute rest is required by the whole holy as well as the affected organs. No immecessary exertion, no motion of the body, no sitting up to evacuate either bladder or bowels, and no straining are permissible; no feed other than liquid; that is, milk and such farinacea as contain least starch,—vix., ground barley or catment, preferably the former. Meat requires more pepsin and hydrochloric acid than a stomach at a temperature of acq, or 106° F, is competent to invash, and the system has no worse enemy than half-completed or unabsorbed peptones. Peristalsis must be stopped, for any disturbance of the consolidation of beginning adjection is followed by the

tearing of newly formed blood-yessels, the occurrence of hemorrhages, and the increase of danger. Opiates should be given by the mouth, rectam, or subcutaneously, or by combined methods, in doses sufficiently large not only to benumb pain or to procure occasional sleep. but to obtain a condition of constant drousiness, even soper, and an effect on the pulse. When there is much vomiting, food ought to be withheld for half a day or a day. There are cases in which even icepills furnish a new source of gustric irritation; still more frequent is the contraindication to carbonic acid gas, which, it is true, gives great relief in some cases, either in an alkaline water or in charmagne. In the later stages of the disease, when the necessity of feeding becomes urgent, veniting may often be avoided by giving, either subentaneously of on the tongue, undiluted, one of a few drops of Magendie's sedution five minutes before the partaking of load. In the first daysof acute peritonitis water is a greater necessity than food. When it cannot be introduced into the stomach, an ounce or two may be thrown into the rectum every hour or two hours without amoving it and without inducing peristalsis of the intestinal tract. A drop of tineture of opium may be added to it.

lee-bags, or, if they be too heavy, the ice-water coil, or iced cloths are applied to the abdomen; the former mainly while the inflammation in still local. When they are objected to, water of the usual temperature may be employed first and the latter reduced gradually. Cold must not be employed too long in very young or aniemic children; in these, indeed, warm applications are tolerated best. As long as an acute peritoritis is still local (pericystitis, peribepatitis), beeches may be expected to do good. No purgatives must be given. In children peritonitis caused by constipution is exceedingly rare, and the recommendations of magnesium sulphate given be genecologists in puerperal and other forms of peritoritis for the alleged reason that it prevents adhesions, though they may be considered justifiable in the adult, do not hold good for the infant or child. If it be desirable to relieve the intestinal tract to some extent, the incitient state of peritonitis may permit of a tepid enema gently administered, with or without the addition of a teaspoonful or half a tablespoonful of oil of turpentine added to half a pint or a pint of warm water, or a few ounces of olive oil may be injected. Rest to the intestinal tract is such an abso-Inte indication that the locking up of the bowels for a week or ten days frequently become a necessity. The tympanites of peritonitis is not the result of constipation, but depends on the paralytic condition of the muscular layers of the gut, brought about mostly by ordenutous offusion into its tissues. But when it becomes very amoving or

dangerous through pressure upon the displiragm, relief may sometimes be obtained by introducing our or more tubes of India subber into the rectim. External applications must not be made because of the danger attending renewed peristable. The question whether puncture of the intestine is advisable, with a view of allowing gas to escape, cannot be answered for every case. Experience has shown that such punctures accomplished this purpose, but also that overextension of the intestinal wall destroyed its elasticity and prevented the puncture from closing immediately. I have seen liquid faces in the abdomical cavity which had escaped through the fine apertures made by the needle of the aspirator.

When the case proves to be one of supportative pentionitis, the accomulation of pus may be circumscribed (a local absens) or the whole abdominal cavity may be affected. In such cases there have occurred occasional perforations into and discharges through the intestine, ureters, bladder, or umbilicus, but it is not windfalls or godsends we have to calculate upon or look for. The choice is between an absolutely bad prognosis and the incision of the abscess, or laparotomy with proper after-treatment (p. 355). As to its performance, I refer to the recent looks on surgery. If I have anything to suggest, it is that the incisions should not be too small. The latter operation has also been recommended as a curative agent in tubercular feritomia. Tubercular peritonitis is mostly a disease of long duration. Its first symptom is quite often ascites, the effusion flaving a high specific gravity and containing much albumin. There may be swelled inguinal glands, which are of little account; hard masses in the abdominal cavity mean exudate, adhering intestines, and sometimes tubercular lymph-hodies of the mesentery. Pain, swelled lymph-hodies about the neck, polynomary and pleural symptoms, and fever are had complications. Many uncomplicated cases get well without special treatment; some with iodides or with general antitubercular treatment (p. 163). Caillé (Festschrift) asserts that medication is of no use, and that in operation should be made early. This much is certain, that it should not be delayed when there is a fever which persists, when medication is unavailing, when the ascites does not diminish, and when emaciation increases. Punctures and inflation of sterile air have hom recommended by J. Daran; but lanarotomy, with emptying of the abdomical cavity and immediate closure of the scound, is frequently made. and many successes are claimed. The alleged causes of the healing influence of laparotomy are many; the contact with chemicals, such as iodoform and other astiseptics, with air, with light, with bacteria entering from outside, or the removal of the evudate itself. It is very

probable, however, that the consecutive hypersensia has the most beneficent influence.

Chronic peritoritis, whether the outcome of an acute attack or an independent affection, has its own indications. The majority of cases are either transmitte or the results of previous diarrhosa, typhoid fever, or tuberculosis. Exercises may be very bulky, and still the case may get well. Rest in bed, warm hathing, and warm poultiors offer great relief. Baths containing iodine, such as St. Catherine, Kreuznach, and the internal administration of potassium or sodium iodide (of iron only when there has been no elevation of temperature for some time) will contribute to the absorption of part of the expedition, particularly when the latter is very massive. An occasional vesicatory will be found opportune. Jodoform may be used as an ointment, or be applied in collection (a to 8 or 12), twice daily, for a long time. Tineture of iodine is less efficient and more irritating. Ascites may require paracentesis, but I have seen many a case improved by indides only, in connection with other diurctics. Sparteine sulphate (scoparius) is one of the best, in daily doses of, altogether, from one to four grains (0.06 to 0.25). It may be combined with the iodide, but not in the same mixture. When the solid excidation is obstinate, the blue ointment may be used in addition to the iodide; it may be rubbed into the inner aspect. of the thighs or forearms, particularly the former, twice daily; not however, into the abdominal wall. Nothing is easier than to transform a mild chronic form into an acute peritonitis by friction and similar traumatism, and nothing more certain than that the modern "massare" craze has multiplied the cases and that every important massage case should be treated by a physician or a conscientious expert. On the other hand, there is no better means of alleviation and prevention than rest secured to the abdominal organs by the permanent wearing by the patients, or by those who ever suffered from peritonitis, of a handage easy enough not to annoy, but sufficiently strug to hold in position the inmble of formerly diseased and still vulnerable adhering intestinal convolutions.

Acrites has been mentioned as the result of the local obstruction of the portal circulation (p. 369), of circliosis of the liver, and of acute and chronic peritoritis; the treatment depends on the cause. Cardiac and result ascites require potassium bitarrate and other salines, now and then drastics, and those drugs which increase blood-pressure and dimensis; digitalis more frequently in children than in old people; sporteine sulphate, caffeine, abstinence from alcohol and, so far as possible, from water; tapping when indicated by dyspuess. Ascites may depend on or be connected with congenital or acquired tumors of the peritoneum. Cystic towors may be chylous, lymphatic, sanguineous, dermoids, echinococcus, or cysticereus. Lymphangious may be simple dilatations, through obliteration of the thoracic duct or other lymphressels, or neoplastic. Possibly now and then a mesenteric lymph-body may undergo cystic degeneration. The treatment is that of asents (paracentesis), and causal if possible; that means extirpation.

Accides chylanus is rare even in the adult; but the young are not exempt. Congenital weakness and fragility of the lymph-vessels, with an without their dilatation (cases originating from lymphangiona are known to have occurred in the adult), and the frequency of chronic periomitis suggest the explanation of their occurrence. Of filariasis in children, I know of no case. Czerny had the case of a gut of ten sears, in which the chylous ascites was due to the pressure on the ducts by ocurian and lymph-gland surcoma. Withelms that of a child with a tumor in front of the vertebral column, in which the disease developed two menths after recovery from whooping-cough.

VIII

Diseases of the Genito-Urinary Organs

t. The Kidneys.

The preventive treatment of the kidwess ought to begin with the first bours of the newly-born. After the second day, and frequently through a period of some two or three weeks, the urine, usually thin and limpid in the infant, is feable to eliminate a large amount of uric acid and urates. They are deposited in the pyramids and papillie of the kidneys, also in the straight uriniferous tubes, even in the crithelia, as orange-colored crystals and an amorphous powder, and are sometimes so copious as to accumulate in the pelvis of the organ and also in the léadder. Not infrequently these deposits are combined with some organic structure, which is dissolved by acetic acid, or with hæmatoidin crystals resulting from small extravasations. A frequent constituent of the deposits is bilimbin, which is soluble with difficulty only in alkaline fluids (blood). Orth and Neumann succeeded in obtaining crystallized bilirubin from the dead bodies of cteric infants. Ouite often the dress of the babe is discolored by them. The presence of this uric acid in/avetion is due to the sudden change in the circulation of the blood; it causes an unprecedented elimination of mitrogenous material which cannot be kept = solution and easily removed, partly because the newly-born is not supplied with a sufficient amount of water. Its speedy expulsion is of great importance, for it gets as a local irritant, and may give rise to a slight or copions renal bemorrhage; to albuminum (which is a frequent occurrence because of the defective construction of the epithelium of the glomeruli), and even to nephritis. Besides, its presence in both the lidneys and the bladder is a ready cause of the formation of renal calculi; indeed, the vast majority of renal calculi and the centres of vesical calculi consist of uric acid with some amorphous organic material. The consideration of these facts conveys at once the conviction of the necessity of supplying the nearly-born with ample quantities of water. Much suffering and illness can thus be prevented."

^{*} See my paper on Nephritis in the Newly-Rorn, N. Y. Med. Januari, January 18, 1806.

The multimations of the kidneys and their (mostly congenital) malignant paradoplamas furnish but few indications for treatment Abnormal shape and suicity of the kitney (sometimes amounting to horseshoe kidney), cystic degeneration of obstructed uriniferous tules," tubular unlessons, careinossa, and savrossa, including sheldosequenceous, which is an early degeneration of the Wolffan body and contains cartilage and muscle, are, unfortunately, not uncommon. I collected pearly four dozen surcompts in the Joeus and infant in my paper on the subject presented to the Eighth International Congress, 1884. From that time dates the differentiation between sarcome and carcinoma of the kidneys, and the eases of the former have become very numerous. Pseudoplasms of the renal capsule are either lipomato or surconute. No treatment can be advised but that of removal before the tumor becomes too large and metastases have takes place; if they are observed at an early period, the case is probahile our of carcinoma, not of sarconsa. (See H. Relm in Festschrift. and Jacobi in Trans. Touth Inter. Med. Congress, 1884.) If nephreetomy be no longer possible, Coley's subcamaneous injections of crysipelas antitoxin may be tried. Fortunately, the diagnosis can be made with satisfactory certainty, and hesides, as a rule, but one kidney is affected. Metastatic deposits in the other kidney or in other organs take place, if at all, at a late period of the development of the pseudoplasm. In cases of sarcoma, the removal of the tumor as soon as the diagnosis (slow growth mostly, tumor painless, sense of semi-fluctuation, colon in front of the tumor, usually no hemorrhage, which is more characteristic of carcinoma, rarely any metastaxis) is mode yields mifficiently favorable results. Concetts (Riv. ned., 18(8) has the following figures: forty per cent. died after the operation; forty-five per cent, died of relapses; seven per cent, were well two years after the operation; in eight per cent, the results were unknown. Schmieder (Deutsche Zeitsch, J. Chie, vol. 1811.) concludes that nephrectomy, mostly performed for malignant tumors, has more favorable results in the young than in advanced years. Of three hundred and twenty-nine extignations one hundred and sevenfrom more made on patients of less than fifteen years; most of these were quite young.

Primary tuberculous is more frequent in the kidneys than in any other part of the urinary tract. It is more frequently descending

^{*} M. A. Goeselaire (Comptendent of its Soc. d'Obst., Gyn. in Part. vol. iv. 1992) publishes a case of vertic degeneration of the kidneys, lieux and purerress.

than ascending, and at first but one kidney is affected, afterwards both; it begins in the cortex, affects the base of the pyramids, and may terminate in abscess. There are enarries and local continuous or paroxysmal pain; blood, pus, connective and elastic filires are found in the urine, sometimes uric acid sediments or calculi. The diagnosis is difficult until bacilli are discovered. They are scarcely found except by contriluging. Repeated examinations may be regaired. For the most careful and comprehensive presentation of the whole subject I advise to compare Fred. E. Sondern = Festschrift. Oi fifty-four cases reported by S. M. Hamill (Internat. Med. Journ., January, (806) seventeen were operated upon; four nephrotomies cured two, improved one; one died. Nephrocomy was performed on nine; five were cured, one improved, three died. Nephrotomy and subsequently nephrectomy were performed on four ; one died. Of Palet's one hundred and thirty-six nephrectomies only twenty-nine proved successful beyond a year's time. General antitubercular treatment with guaincol, etc., should not be emitted. It is here that ammorium sulpho-ielahyolate is recommended. Of a solution in equal parts of water from ten to seventy drops (the latter to adnits) were given three times a day,

Ethinococcus and hydroxephreous famish the usual indications. More than one-half of the latter are congenital, and therefore unfavorable. The secondary variety is caused by congenital hypertrophy of the bladder, pseudoplasms in the bladder or pelvis, calculi or abnormal valves obstructing a ureter, toberculosis or shrinking, with partial obstructing of the ureter, disease of the prostate gland and mothra and its neighborhood. Thus the prognosis of the causal treatment aspiration, drainage, and irritant injections—is demanded. A cystic tumor weighing three pounds may removed from a child of seven mouths by J. Campbell (Br. Mod. Joans., May 15, 1897). It was located in front of the left kidney, and contained three hundred grammes of a clear yellow fluid and a solid mass in which a cartilage and a piece of bone were embedded.

Most cases of Rosting Estacys in infinits and children are congestral; in a few older children, of ten and twelve years, symptoms attributable to that anomaly originated in a fall or jump from a beight. Fortunately, it is a rare occurrence in the first decade; still, I have met with at least a dozen such in the course of more than forty years. Among the dispositions I mention the large size of the adrenals and the congenital flatness of the paravertebral cavity, a flabby capsule and great length of the tenal vessels, also a long. narrow chest and generally weak muscles. Among the causes are rapid loss of fat, increased intra-abdominal pressure (cough, vomiting, constipation), training, and hydromephrosis. The right kidney is mustly affected, it being normally lower than the left. The left curvature of the colon is more closely attached to the ribs and less to the kidney. I never could advise anything better than a song and welltiting abdominal bandage. I have not seen a case in which I felt justified in advising an operation (nephropexy).

Among the symptoms connected with urinary disease there are two of such importance as to render a special consideration advisable, -viz., hernaturia and hemoglobinarie. The former is always the result of a rupture of blood-wessels, which may be occasioned by many causes. Harmophilia furnishes a strong predisposition; so does heredity. Gathrie (Laucet, May 3, 1902) reports the occurrence during a number of years of hematuria in twelve members of a family. Calculus in a kidney or the bladder, nephritis and cystins, neoplasms (mainly carcinens, not often sarcoma), thrombosis of the renal year, or infectious diseases, such as purpura corobro-spinal meningitis, and source or malaria, are among the principal causes of hematuria. So is irritant medication with canthurides or turpentine. There are, besides, cases isolated, or recurrent, for which no tangible cause can be held responsible, not even sudden exposure of the surface or excessive amounts of uric acid or oxalates in the urine. The angioneurotic form I have not seen in a child. The indications furnished in renal hemorrhage by the presence of infectious illagant and thromboo's are clear, but the efficacy of the means considered appropriate is very doubtful. Stone in the kidneys requires Entling the organ with alkali according to the methods to be discussed below. The action of ergot or of hydrastis, either as a fluid or a solid extract. may be tried. If the stormach be rebellious the remedy may be administered in the rectum or subcutaneously. Heart stimulants are often indicated, but digitalis should not be selected, because of its posuble local effect on the kidneys. Strophanthus or sparteine sulphate is swederable. Astringents such as are eliminated through the kidmys.-lead, gallic acid (eight to thirty grains = 0.5 to 2.0 daily) with or without appropriate small doses of morphine, will render good service if given in more than the doses of the books. The temporary application of ice over the bleeding kidney is superior to any other remedy, even in the very young; it may be resorted to before or after the powerful derivant effect of a hot mustard-bath has been tried. Drop doses of adrenalin (Parke, Davis & Co.) may be given several times a day. Ten enhic centimetres (two and a half teaspoonfuls) of

a two-per-cent, solution of golatin theroughly sperifined may be used subcutaneously and repeated, also teaspoon doses of a ten-per-cent solution internally, from time to time. Harrison (Br. Med. Journ., 1846, No. 33) relieved beenaturia by long incistons into the kidney. Israel's cases of the same kind have been in port successful. Even simple exposure of the kidney, and manipulation, had a similar effect in a number of cases.

Hamoglobinuria, resulting from dissolution of blood-cells, is the occasional effect of extensive burns, overexertion, sudden exposure, intense cold, poisoning with potassic chlorate, phosphorus, and in scartatina, syphilis, malaria, and sometimes puroxyomally without a tangible cause. In the urine, besides beinoglobin, blood and castsmay be found; in antopsics mostly blood in the capsule and in the canaliculi, besides detritus.

Nephritis, in the acute, subacute, and chronic forus, is a very frequent disease in infancy and childhood. There is an occasional hereditary tendency. Eyes in the newly-born it is not infroquent (N. Y. Med. Journ., January 18, 1896). In these it is either congestive (from feeble circulation, congenital heart disease, asphyxia, reexposure to low temperatures), or obstructive (from the physiological rapid decomposition of the blood in the newly-born, the formation of harmatoidin - bilirubin, from saundice, from the production of methomoglobin by potassium eliforate or by excessive heat, or from the presence of blood in the uriniferous tubes), or irritative (by uric acid or by learnatoidin infarctions, by the presence of purposic or other hemorrhages, or of microbes and toxins furnished by enteritis or by an infectious disease). As nephritis is not always primary, but quite often a recondary affection, it is liable to be overlooked until it is too late. When this excessive frequency is generally recognized, fatal results will become less common and prevention will be appreclated at its full value. The emmeration of the causes of nephritis will always be incomplete, but the list of those conditions and discuses leading to it comprehends the principal ailments of infancy and childhood. First of all, there are the acute infectious diseases; scarlating, diphtheria, measles, rubella, varicella, vaccinia even, malaria, typhoid and cereleo-spinal levers, amygdalitis ("tonsillitis"), parotitis, and pwaemia. No hocilli are required to cause a toxic peptiritis; their toxins do it as well. Malaria is a frequent cause of nephritis in some countries or regions (Busey, Am. Med. Acto., (880); the South of the United States, the shorts of the Baltic Sea and of the lower Danube. There are constitutional disorders, such as syphilis, purpura, and diabetes, also enteritis, extensive eczema, or impetigo, changes in the

superficial circulation resulting from sudden exposure, sometimes also from the persistent influence of a low temperature. The latter is not so outnous as the former. A fall into the water or exposure to a rain-storm may cause an acute nephritis (interstitial or bemorrhagic). which may prove fatal in a few days. The slow influence of cold temperatures is better borne, almost as well as compulsory overwork of a kiffney (for instance, after the other has been removed). Stasis and thrombosis, depending on pulmonary and cardiac diseases and diarrhem, have the same result. Irritation of the kidners by medicinal agents also leads to nephritis; for instance, gotassium chlorate, mineral acids, salicylic, carbolic, and pyrogallic acids, surpentian, naphtol, styrav, petroleum, tar," large doses of lead, phosphorus, arsenic, mercury, and manganese, -part of which are used for internal, part for external molication; finally, irritation of the organ by the uric acid infarction of the newle-born, or by renal calculi, which are by no means rare in the very voting, gives rise to inflammation. Most of these injurious substances exhibit their detrimental effect the more the younger the infants; in them a single external application of a solution of carbolic acid has sufficed to produce nephritis. The large number of causes of neptiritis, as enumerated above, if beeded, teaches at least two lessons: first, that supine expectancy in the treatment. of digestive and infectious diseases is very hable to become criminal; and, secondly, that the offset of every irritating remedy, both internal and external, must be carefully watched.

Nephritis should never be overlooked. Almost no diagnosis of any disease is complete without an examination of the urine. An elastic catheter is more easily introduced into the bladder of a male infant or child than into that of an adult, and in the other sex it is almost equally easy. If the catheter be not used, absorbest cotton will furnish a sufficient quantity of urine, or a rubber bag over the peris will secure it. The examination for allumin should never be omitted in a doubtful case or in any of the infectious diseases. Alluminaria should never be considered an indifferent matter, not even the "physiological" secretion of a faint trace of albumin in the newlyhorn. It certainly means an inefficiency of the glomerular epithelium. In nephritis of whatsoever origin it is one of the symptoms, no matter

^{*} Balance of Peru has also been charged with occasioning nephritis. Beintigam and Nowark, after breing made daily examinations of the mines of tecrity-two patients, though administering internally fifty-two and eight tenths grammer in eleven days and in another case eighty grammer in twenty-four days, found that it has no such detrimental affect provided it be free of othercal oils (Centrally, I. Mis. Med., No. 7, 1800)

how triffing its amount in the chronic form, in which it may be absent for days or weeks. Toxins contained in the intestines will cause it; in many cases there is indicannin at the same time. If the venous circulation is much obstructed during digestion, particularly when the efferent vessels of the renal territory are without valves, albuminaria may result. Cyclic albuminaria was first described by Pavy, 1885. It was given its name on account of its absence early in the morning (and late in the evening); as soon as the recumbent position is given up and the muscles become active, it reappears. As it points to some instability of glomerular circulation and to epithelial incompetency, it should not be made light of, for it may lead to nephritis. I think I have seen a good effect from gallic acid, which may be given a long time in daily doses of from eight to thirty grains (0.5 to 2.0).

When acute nephritis has been fully established, the first indication consists in the procuring of relief for the congestion of the kidneys. The child must be in bed, the skin warm. A hot air both, of a duration of from ten minutes to one hour, of the whole body with the exception of the face, will cause copious diaphoresis; a warm bath, with or without mustard, will fill the cutaneous blood-vessels and relieve the internal circulation; dry cups and hot poultices applied to the renal region will have a similar effect. The mucous membrane of the intestinal tract should be made to share in the action of the skin; therefore, magnesium sulphate should be administered in doses sufficient to produce three or four daily evacuations, or calomel in small doses frequently repeated. The arterial tension should be reduced by nitrites, particularly when there are cerebral symptoms; besides aconite in frequent one-quarter-drop doses, small doses of opium frequently given, or chloral hydrate may be tried for the same purpose. Digitalis should be avoided in acute cases. but when exhaustion is threatening, strophanthus or sporteine sulpinte may be administered with the nitroglycerin. Potassium iodide acts favorably in the same direction; sedium sulpho-ichthyolate has been recommended for the same ourpose by Senator, who gives to an adult pills containing from one decigramme (one and a half grains) to one gramme (fifteen grains) daily,

The greatest care must be bestowed on the diet of the patient. Whatever is irritating must be avoided; for instance, alcohol, spice, or iron. The food should be exclusively liquid, warm or hot, and compatible with the vulnerable condition of the kidneys. As the first products of the metamorphosis of albuminates are eliminated through these organs, and some of its products, such as phenol, creating and extractive materials in general, may become positively

poisonous, it follows that strongly nitrogenous foods—the opposite opinion of Oertel and Loewenmeyer and their followers notwith standing—must be prohibited. No eggs should be given and, as a rule, no meat; now and then an exception may be made in favor of yeal, spring lamb, chicken, fish, or oysters; but, as a rule, the diet in acme nephritis must be confined to milk and farinacea. Barley, wheat (stale bread), hominy, rice, and potatoes are permissible, also green vegetables and fruit. The beverage consists of water or an alkaline mineral water. Lemonade is permissible unless it interfere with the digestion of milk. Neither in the acute, nor subscute, nor chronic form of nephritis must muscular exertion be allowed, for this increases the metamorphous of the albuminates. Moderate exercise, however, is not contraindicated in the chronic form; in the latter the elimination of albumin is not increased by exercise.

The surrounding air is to be fairly usern other the patient is in bed, quite warm when he is about. The function of the skin must not be suppressed; a moderate amount of perspiration is beneficial. Thus it is that there is constant indication for warm bothing and a warm elimate, for both dimmish the labor of the leitneys (as also of the lungs). As moist air interferes with the action of the skin, a dry climate is preferable. Her bothing must be avoided except to the very beginning and in the occasional emergencies of uramis.

Subacute nephritis, with its limpid and sometimes coulous urite, changeable percentage of albumin, incidental orderes and gradual diminstion of strength, occasional presence of arterial contraction and of cerebral symptoms, is often overlooked. It is a frequent sequela of scarlatina and diphtheria. Hot-air and hot-water boths, and iron, that is deposited in the epithelium of the arimierous tubes (which is thereby subjected to premature elimination), should be avoided. Digitalis is contraudicated during high attend tension: indeed, there are but few cases which permit its administration. Small doses of opium benefit the circulation in most cases of unessia complicated with high amenal pressure; so do the nitrites (sodium nitrite from two to six grains (0.1 to 0.4) daily, nitroglyceria onetwo-hundredth grain, more or less, several times a day, or the sport of nitrous ether), chloral hydrate, and sporteine sulphate. Mercury in small doses (corrosive sublimate), from one-fifteenth to one-tenth grain (0.004 to 0.006), largely dilated (1 to 8000 or 10,000 at least), may be given daily, week after week, and may be combined, in afebrile cases only, with small doses of iron. The alleged irrantion of the kidneys by merenry need not be feared in these dotes and dilutions. The air should be warm, a dry, warm climate selected. and a warm both given every day, with gentle fraction. Large quantities of water, both pure and alkaline, should be shumred, for the functional activity of the kidney must be diminished so far as computible with a normal circulation and moderate metabolism. This rule is particularly stringent during the presence of local or general dropsy. Here the amount of liquid consumed ought not to be greater than the quantity of urine discharged. Mild disphoreties and purgatives will also relieve the labor of the kidneys. When the amount of mic acid in the urine is persistently large (lithamic disposition), sodium salicylate may be administered daily to the total (daily) amount of from ten to fifteen grains (0.6 to 1.0), or sodium bicarbonate in twice the doses.

Chronic nephritis is of frequent occurrence. The presence of occusional headaches, or of vomiting, or a slow convalescence from any ailment is suspicious, and calls for the examination of the urine. As albuminuria is not always present, and the amount of albumin very changeable, that examination must be repeated at short intervals and with the best methods; indeed, the use of the centrifuge reveals many a case of alleged triffing albuminuria, even of "transient" albuminuria, to be nephritis. That albuminuria should be differentiated from peptoruria (in the suppurations of empyema, bones, abdominal tumors, intestinal ulcerations, and in meningitis, sometimes in scurvy, rarely in syphilis, in phosphorus poisoning, and in acute rhenmatism, also in leucocytosis of different origins) is self-understood; also that the albumin of pyclitis or pyclonephritis should not be mistaken for that of rephritis. The absence of dropsy or ordens proves nothing at all, particularly in the very young infant, in whom chronic nephritis without dropse is a frequent occurrence after pleurisy, pneumonia, eresipelas, or in syphilis. Indeed, the most dangerous cases and complicated with uraemia are those in which no dropsical symptoms are apparent. Many a case of chronic nephritis could be presented by the discovery of the acute or subacute stage preceding it, and by heeding its many causes. I have seen a number of cases complicating or rather depending on purpura, in which evidently the pressuce of small hemorrhages in the renal tissue gave rise to the initial eritation. In these cases the constant use of phosphorus (one-onehundred-and-fiftieth grain twice or three times daily) during two or three months in succession added greatly to the final recovery.

Now and then a case of chronic nephritis will recover. The majority of those I have seen getting well took corrosive sublimate. The "poisonous" effect of the drug was not apparent in such cases, nor in any case where it was watched. Children of five years may safely take one-fiftieth or one-sixtieth of a grain (0,001) in a tablespoonful of water three or four times daily for many weeks in succession. When its intermission is deemed advisable, or together with the mercury, potassium iodide may be given in doses of six or ten grains (0.4 or 0.6) daily. At the same time iron may be administered, the chloride (or one of the milder preparations), from ten to twenty drops of the tineture daily. A gentle stimulation of the kidneys by preparations of juniper or potassium bitartrate or citrate is advisable. Strong irritation of the kidneys must be avoided; digitalis is apt to do harm, except in complications with valvular lesions of the heart. To increase diuresis through strengthening the action of the heart, sparieine or caffeine renders better services; the latter, however, should be carefully avoided when there are any cerebral symptoms. Among the best diaretics, through relieving the heart while diminishing arterial tension, is nitroglycerin or other nitrites. the mildest of which is sweet spirit of nitre. Small doses of opinn are often useful. In cases of obstinate vomiting it is often the only reliable remedy. Discretin appears to act more on the renal epithelia. and may be given strilly, in doses of from free to thirty grains (0.3 to 2.0), according to age.

The prognosis of chronic nephritis (and of many cases of the acute form) being had or doubtful, the operative procedures advised by Harrison, Israel, and Edebohls deserve attention. Harrison divides the capsule in acute cases for the relief of symptoms and the provention of chronicity; Israel in chronic nephritis for hamaturia and renal colic; Edebohls removes the fat from the dissected capsule for the purpose of starting a collateral circulation.

The regulation of diet and hygiene is vital. No exposure to cold, no undden changes of temperature; a warm and uniform climate. The chances of recovery diminish with the impossibility of obeying this rule. Segourn in a hospital to refuge for the poor, as a makeshift. The proteids must be restricted, with the exception of milk. But it should not be forgotten that iron is almost absent from milk. That is uty iron has always been recommended. Fruit and cereals contain it and should take the place of meat. Unfortunately (Van Noorden), the white meat contains almost as much extractive substance as the dark. Avoid alreads.

Chronic nephritis may call for immediate and strong measures during some of its worst sequelae. Uraemia (rarely preceded by aphasia, occasioned by the accumulation of urea in the blood, the presence of cerebral sedems and of arterial contraction and brightened blood-pressure, and by reflex irritation of the motory centres) results

in vomiting, diarrhora, coma, and convulsiom. Strong purgatives may be required at once (calomel, from five to ten grains; elaterium, one-twentieth grain; or croton oil, from one-twentieth to one-tenth grain every hour, to be followed by magnesium sulphate), or strong disphoretics (bot-air bath, bot-water bath, bot-water pack, pilocarpine, aubcutaneously, in doses of from a fifteenth to an eighth of a grain), and occasionally, when the symptoms of cerebral hyperamia predominate, a few leeches to the septum narium (the preferable place) or the mustoid processes will save a case from imminent destruction. In older children a venes-ection may sometimes be required. If it is to be helpful it should not be deferred. When, however, much fluid is climinated from the body through all these procedures, a new supply must be introduced either by the stomach or by the rectum. Injections into the subcutaneous tissue, or into a vein, of large quantities of sterile salt water may be life-saving. Other sequebe or complications have each their own indications; cedema of the glottis cannot wait for the effect of the above medication, and demands either scarification, or tracheotomy, or intubation. Hydropericardium and hydrothorax require paracentesis when the symptoms are urgent. Ascites demands paracentesis to relieve dyspuca and to facilitate the function of the abdominal viscera and of the circulatory organs. Quite often dimetics will begin their effect only after the pressure on the kidneys has been removed.

Hypertrophy of the left (and right) heart is in adults sometimes coordinate with chronic nephritis, in children it is almost exclusively secondary to it, "compensatory through the influence of the nervous system, also arterial change, irritated, it may be, by the later acquired toxic state of the blood due to defective renal function, lum in part also to the primary cause which produced the primary renal disease, be it lead, gout, syphilis, alcohol, and the like" (Tyson in Festschrift).

The frequency of retal calculi has been alluded to before. Indeed, they are quite common, have been observed to occur in the forms, and give rise to many attacks of screaming, with dysuria, local pain retraction of the testicles, to the occasional presence of pus, blood, and gravel in the urine, and to voniting and convulsions. Most of them consist of uric acid, very few of oxalates, of cystin (several cases in a family), or of aumionism and magnesium phosphare, and derive their positive indications for treatment from their chemical composition. Unfortunately, however, the composition is mostly not uniform. Of forty-four cases of L. Spiegel (Best. M. Wark, No. 27, 1900), two consisted of phosphares, one of uric

arid, one of xanthin, two of eyetin, and the rest were of mixed consistency. Oxalates are frequent causes of stones in the kidneys of adults, rare in childhood. They are best dissolved by saits of magnesium, with a diet consisting of fish, fat, bread, rice, apples, and plenty of (soft) water. Calcareous deposits (carbonates or phosphases), which are found in the newly-born at the lower end of the straight camiliculi, near the papillar, and also in epithelia, being whitish, have been mistaken for interstitial infiltrations. Calculi, however, are not exclusively anorganic. The first uric acid infarctions are covered with organic material, and the calculus is gradually formed of the miscure. of both. Small henorrhages also contribute to it. Indeed, henorrhages may be both the results and the causes of calculi. Meckel spoke of a stone-forming catarrii in the kidneys, as we now know that a cutarrh of the gall-bladder occasions the Jornation of gallstones. Particularly in those cases which occur in gonty families the diet must be limited to a very small quantity of nitrogenous lood Meat may be permitted once a day, white rather more than black (see, however, p. 186). Celery, parsley, asparagus, and all irritants should be avoided. The patients should be encouraged to drink much water, alkaline waters to be preferred. All of these contain more sodium than potassium; this latter having a greater affinity to uric acid. potasseum bicarbonate, in daily quantities of from ten to twenty grains (o.f. to 1.8), may be given in Seltzer, Vichy, Bethesda, Poland, or Wankesha water, large amounts of which ought to be administered. The natural lithin oraters contain less lithia than the occasion calls for; the lithium carbonate taken during a day ought to amount to from three to eight grains (0.2 to 0.5). Thus the artificial lithia waters, if carefully prepared, are preferable to those furnished by nature. Piperazin (and lysidin) may be given in three daily doors of from two to five grains (0x125 to 0x3) each. Unstropin is credited with the greatest solvent powers of all. In the test-tube it certainly has them. I gave it a long time, at alternating periods, to a child of two years. Without it, the uric acid appeared in the urine as a powder, with it in copious accumulations of poedles. Urm, in a fiveor temper-cent, solution, from one-balf to one teaspoonful three times a day, deserves a trial.

The presence of a stone in the kidney, heades giving rise to the symptoms enumerated above, may produce result entersh, and secondary entersh in the nester and the bladder. When it leads to pyrlists or pyrlousphrinis, the treatment directed against their cause should be continued. At the same time gallic acid in daily doses of from eight to twenty-five grains (0.5 to 1.5) should be given, and balsamics (cubeb, copaiba) may be tried if the storach permits. Methylene-blue (not pyokranin) I have tried largely and persistently. It reduced neither the quantity of pus nor, whenever present, the alkalimity of the urine. In uncomplicated pyelitis the urine is apt to be acid. Succharin deserves to be tried, from one to five grains daily. When the kidney is enlarged and pyemia threatening, surgical interference is called for. Nephrotomy or nephroctomy may save life. Pyelitis, when resulting from tuberculoses, indicates nephrectomy assoon as the diagnosis is beyond doubt, and particularly when puscous are found, for they are more harmful than bacilli coli when cursing pyelitis.

z. The Bladder,

Of cystitis, infancy and childhood exhibit every possible form, from the catarrhal to the ulcerous or diphtheritie; the tuberculous form is very rare in children. It is, however, more frequent than Ashly is willing to admit. Exposure to low temperatures, chilling of the parts by sitting on cold stones or wet grass, trauma, vulvo-vaginitis, the immigration of bacterium coli mainly during and after follicular enteritis, the administration of cantharides or other irritants, the drinking of beer, severe indigestion, constitutional diseases, such as pneumonia, gastro-enteritis, meningitis, typhoid fever, variola, or diplitheria, and the presence of stone in the bladder are just as many causes. Dysuria, retention or incontinence, resical and rectal tenesmus, the presence of mucus, pus, and blood in the urine, fever, and secondary personitis or "typhoid" symptoms are among the possihilities. Traums demands absolute rest in hed, and either cold or warm applications, besides opium, which may be administered interrally or in suppositories; exposure ("cold"): warm bathing, disreties and a narcotic; the esstitis of infections fevers; rest in bed and tonics; that following the use of cantharides (administered internally or in resicutórics): from two to ten grains of camphor (0.125 to 0.6) daily, internally; severe indigestion: the correction of the alimentary disturbances by abstinence, purgatives, and plenty of water; hyperacidity of the urine; the use of alkaline waters; hyperalkalinity: that of hydrochloric acid; vesical calculus; its removal, preferably by the suprapolic operation. In most cases the patient ought to be kept in bed, apply warm positices, drink plenty of carbonated alkaline water, abstain from cold beverages, live mostly on milk and farinaceous food, keep his body warm, particularly abdomen and feet, take a door of calomel, and an opiate for occasional relief. But by far the best symptomatic remedy in the spasmodic pain of evstitis is brosevamus; from two to four grains (0.125 to 0.25) of

the extract may be taken daily for an indefinite period. The chronic cases of children of from three to six years require the internal use of boracle acid or potassium chlorate (from fifteen to thirty grains daily), turpentine, gallic or tamic acid, usa ursi, and salol or salicylates; the latter if there be no nephritis at the same time. Urotropin in daily does of from ten to thirty grains (o.6 to 2.0) is highly extolled in a number of instances the local treatment of the hiadder is indispensable; the hiadder may be washed out with sterilized warm water, or salt solution (6 to 1000), or a warm solution of boracle acid (two or three per cent.), or silver nitrate (one-quarter or one-half of one per cent.), or lysol (one-quarter of one per cent.). The silver nitrate irrigations should always be preceded and followed by those of warm water (not salt water), which are to be continued until it returns clear. This procedure requires sometimes, particularly in young children, anasthusia by chloroform

Some of the symptoms met with in cystitis may occur without the presence of the latter. Painful against during micturition, retention of the urine, or incontinence is very frequent under the influence of quite a number of different conditions; it is upon the causes that the treatment depends. Retention may be caused by a chronic spasm of the sphincter muscle, as in congenital or acquired stenosis. That, as well as paralysis of the bladder, may lead to retention, dilutation, and residual urine, with cystitis. Such a congenital stenosis bears the same relation to the bladder as the congenital stenosis (spastic or organic) of the pylorus to the stomach. The urine may contain besides a superabundance of uric acid, salts or hile, or irritants of a nature which cannot always be determined accurately. Thus, preicaris of the surface, when resulting from jugesta, is quite often complicated with vesical spasm, so that it appears that the same cause acts similtaneously on the external and internal integuments. Dynaric may also depend upon a painful condition of the urethra resulting from acidity of the urine, or the transmission of a vulco-vaginitis, or congenital contraction of the urethral orifice, or adhesion (mostly acquired) of the labin majora, which is easily corrected, or a halantis resulting from the irritating effect of urine retained round the glam penis by phimosis. The indications for treatment in all of these cases are so plain that the commeration of the etiological factors some to be sufficient. There are also cases of irritable bladder, as well in the young as in the adult, in which the result of the treatment gives sometimes the explanation of the cause. In a few cases the introduction of a catheter was sufficient to relieve the spasm of the neck, in others the administration of byoscyamus proved satisfactory

(from one to three or four grains daily, according to age), or camphor with hyrocyanus or opium, or monobromated camphor, from two to right grains (0.125 to 0.5) daily. A sufficient dose of codeine for the aight. But the diagnosis of "irritable bladder" is too often made to cover ignorance of local diagnosis.

Retention of urine by local arony and paralysis is rare in children. except as the result of hyperextension during school hours; still, it may occur in the course of spinal diseases. Now and then there are mechanical obstacles. In the newly-born the colliculus seminalis is often quite large and requires the introduction of a sound. Large stones in the bladder, or a smaller one near the neck, or one impacted in the urethra, or a string tied round the penis and buried in the swollen tissue, or the epithelial closure of the urethral orifice, or an ordenatous prepace are more or less amenable to a diagnosis and speedy amelioration. The injection of warm or cold water into the bladder, warm bathing or hip-bath, the correction of the epithelial adhesion of the prepace, and the use of the catheter or sound find their ready indications. Resention during infectious or cerebral discases requires great attention. Unconsciousness is a frequent cause, and frequent percussion of the bladder ought to be resorted to when the brain becomes insensible to the expansion of the organ.

Evidently the causes of retention are very numerous; one of the most puzzling cases was that in which the accumulation of urine was very great. The introduction of an elastic catheter, though it entered to its full length, availed nothing; a metal catheter entered with difficulty until it suddenly appeared to overcome an impediment and the urine was expelled with great force. The antopsy gave the explanation of the singular occurrence. The whole bladder was lined with a thick diplinheritic membrane, which was easily detached but did not admit the elastic catheter. This was deflected along the wall of the bladder, while the silver catheter succeeded in perforating the pseudomembrane of the diphtheritic cystitis.

The great variety of the causes of incontinence of arine requires tact and discrimination in the election of remedies. If there be an excess of urine, its cause (diabetes, brain disease) should be looked after. General amenia and muscular debility, rhachitis, and tuber-culosis indicate a diet carefully selected for its mutritiousness and digestability. Gentle mustage of the whole body, spouging with alcohol and water (1 to 6) or with water, and efficient friction with thick towels, sea-bothing, and the use of medicinal roborants, such as iron or arsenous acid, will always prove beneficial. The elixir pepsini. hismathi, et strychnine of the National Formulary is a good prepara-

tion in insufficient gastric digestion, with atony of the stomach; a child of three years may take a teaspoonful three times a day. Many a case, mainly in neurotic families, requires persistent treatment for neurasthenia; several continued to adolescence, and could not be cured until the young women were sent to strangers, away from the influence of their neurotic families. Many a case of incontinence, however, that appears to be functional only, is really the organic result of a local cystitis or urethritis (Fr. Bierholf in Festschrift).

Attention should be paid to the capacity of the bladder. In every case, particularly in the evening, the quantity of fluids allowed should be restricted. The signoid flexure and the rectim should be empty at night, and the patient should be encouraged to evacuate both bladder and rectum before retiring. After a few hours' sleep the children ought to be taken up and roused sufficiently for both purposes.

Muscalor debility of the neck of the bladder (sphincter) requires general and local stimulation. The child should be encouraged to hold the urine as long as possible. Stryclmine or other perparations of mux vomica prove effective to a certain extent by improving both the general innervation and the appetite; in desperate cases an occasional subentaneous injection into the permeum (from onefortieth to one-sixteenth grain) has rendered good service; an ointment of one part of extract of nux vomica in from ten to sixteen parts of fat, introduced into the rectum (size of a coffee or lima beau) several times daily, will also act well and may be continued for some time. The same indication is fulfilled by ergot, the fluid or the solid extract of which may be employed internally. The interrupted electrical current is perhaps the most powerful local stimulant; one of the electrodes is applied to the perincum, the other to the hypogastrium or the lumbur region. Maybe the psychic effect of the applieation is an effective as the current itself. The advice to apply the negative pole to the interior of the urethra or bladder and the positive somewhere externally is had because of the danger of urethritis and cystitis. It is particularly in those cases in which the sphineter is liable to be overcome that the raising of the pelvis (by pillows, by raising the foot of the bed) has been recommended. The method is quite clever from a mechanical point of view, but the patients are not patient enough to sleep that way.

Whenever there is exalic acid or sugar, or an excess of urates and phosphates, or bacteria in the urine, the source of the disurbance should be attended to. Excess of uric acid (uricemie, Jules Comby in Festschrift) is often found in goutty, obese, asthmatic, diabetic, or neurotic families. A moderate diet of white meat, fish, eggs, milk-

farmacea, and fruit is recommended. No constitution must be permitted. Much water (alkaline) and hygiene of the skin (cold water). The digestive disorders forming the source of the anomalous condition require a corresponding change in the diet (diminution of nitrogenous food) or correction of the functional disorders of the stemach and liver by dilute hydrochloric or nitrohydrochloric acid and an occasional purgative. Until that can be accomplished the prognosisis very uncertain. Vesical catarrh, nephritis, and the presence of a calculus in either the kidney or the bladder have their own indications. From the latter it is removed by the suprapshic operation. The hyperasthesia of the body of the Nadder, complicated or not with casarrh,-it is often found without it,-requires belladonna or its alkaloid. Both belladoma and atropine are tolerated in much larger doses by children, in proportion to their size or age, than by adults. In many cases a single evening dose of extract of belladonna (gr. 54 to 1/4 to 1 = 0.015 to 0.06) or atropine sulphate (one-one-hundredth to one-seventy-fifth) answers well, sometimes to an unexpected degree-Potassium bromble (grs. 6 to 25 = 0.4 to 1.75), chloral hydrate (grs. 2 to 10 = 0.1 to 0.6), camplior (grs. 2 to 5 = 0.125 to 0.3), extract. humeli fluidum (minims 4 to 10), the elixir humili of the National Formulary, in teaspsonful doses, given at bedtime, or tinct, rhois aromat., from ten to fifteen drops several times a day, answers a similar purpose.

Causes of reflex contraction located in the vagina, penis, or rectumrequire local correction. Vaginal catarrh is as obstinate because of its inaccessibility as it is frequent. Polypoid excrescences about the vagina or in the urethra (of the female) demand removal; if there be phimosis, circumcision is required. But a great many cases which are presented for that purpose can easily be remedied by gentle dilatation of the prepare. Firm adhesion of the prepare requires careful detaching. Pruritus of the sore surface, depending on rancid smegmaor decomposing remnants of urine, requires bothing, cleanliness in general, and boric acid powder. Intestinal worms must be expelled, and the fact remembered that oxyuns has its original seat in the upper part of the colon and the lower part of the ileum, so that rectal injections have but a temporary effect in most cases. Fissarcof the rectum, mostly of small size and located posteriorly, requires forcible dilatation,-a procedure which demands little time and penerally no angesthetic, but is very efficient.

Irritability of the neck of the bladder and the prostatic part of the tirethra has been treated by Henry Thompson with camerization by means of a two-per-cent, solution of silver mitrate. A solution of one

part in a thousand of distilled water will be found sufficient, or a solution of one or two parts of tannin or alium in a hundred. General methritis does well with protargol (from one-half- to two-per-cent.) irrigations. Still, it is a better plan to introduce either an elastic carbeter or a metal sound into the bladder, every few days, for two or four minutes. A few drops of a two- or three-per-cent, cocaine munstesolution instilled into and distributed in the urethra a few minutes before the insertion of the instrument will in many cases reader geseral aniesthesia superfluous. The latter, however, cannot always be dispensed with. In the case of a girl of three years, with chronic catarrit of the bladder and incontinence, anaesthesia was required a dozen times, for two purposes,-first, to inject a solution of silver nitrate (t to 1000) into the bladder, and, secondly, to dilate forcibly. with increasing amounts of water, the organ, which had habituated itself not to hold more than a few drachms of duid at a time. This forced dilatation under angesthesia I had to resort to in several cases. with fair results.

Masturbation, which is so frequently the cause of irritation of the prostatic portion and thereby of incontinence, has its own indications (p. 403). Bodily punishment will avail but little in the treatment of incontinence from whatsoever cause, except in the dimmal form, when the boy refuses to give up his game, being either too much interested or too indolent.

In a number of cases the removal of admoid growths or the resection of greatly hypertrophied tonsils has relieved incontinuous (F. Huber and others).

Transors of the bladder (surcoma, myxtoarcoma, fibroma, demotd) require superspuble extirpation. The suprapuble operation has also supersoded lithourity in vesical calculus (incontinence or retention, sometimes suidden interruption of micturition, pain in rectum, perincum, or glans penis, rarely hamaturia or cystitis).

2. Other Organs: Anomalies and Diseases.

The development of the genital organs begins in the sixth week of embryonic life: that of the proceedal septim, by which the prefirm of the penis is formed, about the middle of the third month. About the same time the anterior part of the prethra is developed by the tovagination of the epidermoid integrment of the glans penis. This invagination extends backward to the valvula Guerrin in the fossa pavicularis. Here, where the two parts of the prethra are to meet, the opportunity is furnished for the occurrence of many anomalies.

The invagination may not take place at all. In that case there

is no indication of an anterior urethra. There may be a superficial epithelial obstruction of the urethra after it has been formed, with retention of urine behind it; or a partial contraction or narrouness of the external orifice, particularly in cases of genuine phimosis; or a genuine stricture in the pars cavernosa, of which instances have been reported by Guyon, Englisch, and Demme; or an extensive obstruction mostly complicated with rectal anomalies, and retention of urine, dilatation of the ureters and renal pelves; or, finally (in a few reported cases), obstruction of the neck of the bladder, with the same disturbances imbess the urachus be forcibly kept open.

The emission of mine begins about the middle of fertal life. Sometimes the connection of the two parts of the srethra has not been established; in that case there is a dilatation behind the fossa ravicularis with a constantly growing lake of urine. Its pressure may succeed in breaking through the obstacle with or without the formation of a valve, or it will burst the lower wall of the prethra behind the obstacle and cause a mild form of hypospadias. If the urethra be perforated farther back, the hypospadias may be scrotal or perineal. That hypospadias may occur in this way, and not only by an arrest of development, is proven by the occurrence of cicatrices and such contraction as depends on cicatrization only.

Many of these anomalies are the subjects of surgical interference. Fortmortely, all of them are rare, as the careful reports gathered by Kauffmann in "Deutsche Chirurgie," and Bohn in "Gerhardt's Manual" will prove. A double methra was described by Englisch (1895). Epithelial obstruction of the external oritics can be remedied by practuring and dilatation; one such case I have seen thirty-five years ago, and never since. Membraneus obstruction in the fossu navicularis has been pierced; even a case of fortal imperforation of the tokole gloss posis has been perforated by Rauchiluss with apparent success. Congenital strictures have been treated with household, or the knife, or both, and laminaria tents used to render the effect permanent. And hypospadias has been greatly benefited by operative procedures, with better success in modern times than the plastic operations of Dieffenbuch could boast of (Carl Beck).

The prepace begins to be evolved about the end of the third and the beginning of the fourth month of embryonic life. Within a month afterwards it extends to the middle of the glans. Its covering epithelia are povement. They form from six to eight superjacent layers, and extend as far as the wrether and sometimes into the fossa navirularis. They also constitute the more or less numerous accuiminations, principally near the corona glands, which were formerly taken to be fat, the so-called epithelial pearls. They are met with as early as the fifth month of fortal life. They are sometimes so large as to raise the adjoining part of the prepare from the surface of the glans and to form small cavities around themselves, thus contributing to the spontaneous separation of the preparal udhenious.

These adhesions are vastly more frequently soft agglutinations than solid unions. The causation is simple: as the prepare and glans are in close juxtaposition, the epithelia of both remain moist. and thus become coherent. It is only in those cases in which the prepare does not snugly cover the glans-for instance, in hypospadias and epispadias-that no, or but partial, cohesion takes place. There are cases, however, in which the union of the two surfaces becomes quite firm, partly in consequence of the occurrence of an inflammatory exudation, and partly because of the existence of an extraordinary number of superficial papille, which, according to Englisch, grasp and join one another. Thus the soft cohesion of the prepace and glans penis is a physiological condition, and therefore met with in almost every male child. The degree, however, to which it is developed is inble to differ. The prepute of the newly-born being long, it may cover the whole glans down to the orifice of the urethra, and then by its overlapping adhesion give rise to retention of urine, and, in consequence of irritation by urine, and of the traction invariably connected. with the slightest changes in the shape of the organ during micturition, to pain, reduces, muco-puralent secretion, sometimes moderate extravasation, and erections which again produce a local irritation of the surface. It is the erections, when frequently repeated, and when occurring more normally in later years, combined with the effects of the cavities formed round the spithelial pearls, which usher in the gradual and final separation of the prepuce from the glans periis. That process takes place between about the ninth and thirteenth years of life. Thus, in the wast majority of cases, no interference is required. The more gradual the separation takes place the safer it proves. It is only artificial disjunction which may become a danger by secondary changes. The only reasons for interference are retention of urine and balanitis, both of which are often found together. In most cases the separation is accomplished quite easily by holding the glans gently but firmly between the fingers and pushing or pulling the prepace in the direction of the corona. Towards the end of the operation the pearls make their appearance; the separation, however, must be completed without interfering with them, and the prepace then carried forward again to avoid paraphimosis; for there will be

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some slight ordema by which the latter might be occasioned. Before that is done, the application of vaseline, or zinc or lead outment, or a dust of horacic acid, or bismuth subcarbonate, or a mixture of one part of salicylic acid, fifteen of bismuth, and twenty of talcum, is advisable. Carbolic acid is contraindicated because of its tendency to facilitate bleeding, though that he ever so slight. In most cases it is best not to repeat the procedure for some time, in order not to disturb the healing and hardening process. Every wound or tear may bring on cicatrization and secondary phimosis. In some cases the separation does not take place quite readily; in them a blum probe introduced between the two layers will overcome the obstacle. Probe and fugers will succeed, if care and time be taken, not only in accomplishing the end in view, but also in avoiding tearing, bleeding. ordens, and inflammation. The occurrence of ciratrication is always a serious matter. I have succeeded without it in many more cases. than I could take notes of; for the number of cases in which the medical man is consulted in reference to the advisability of circumcision-which is one of the modern onslaughts upon the genitourinary organs-is very great. Twenty-nine out of thirty alleged cases of unconquerable phimosis are exactly of the land in which a patient reduction and separation prevent both a surgical operation and a surgical fee. The solid cohesion which requires the use of the knife and a careful and expert operation is very rare; I have seen has few that were complete in a lifetime. I cannot imagine that a total synechia is curable without a plastic operation or, better still, the total removal of the prepuer after its separation; for new adhesion must follow the operative separation in the absence of muccess membrane.

From what I have said it follows that we cannot recognize the existence of an actual phisnonis in the young before an attempt has been made to relieve the epithelial agglutination. The actual cases may exhibit a long or a short prepace, be partial or total, congenital or acquired, atrophic or hypertrophic. The latter species is often dependent on changes in the internal lamina of the prepace, which, when originally contracted and tight, is subject to inflammatory and exudative processes; the atrophic form is due more frequently to a defective development of the integument, which thereby becomes attenuated. Both of these forms are liable to be congenital, and either is found as well among infants and children as in later life. The degree of the phimosis depends upon the development of these anomalies, and also upon the degree of the presence of the riastic layer described by Reiner and situated between the two laming of the prepace.

Phimosis may be acquired by pathological changes of the tissue depending on accidental morbid processes. Dropsy may so swell the prepare as to result in it. The framulum, congenitally short or otherwise, may suppurate and cicatrize. Inflammation and ulceration from whatever cause, irritation and tears following inconsiderate or unsuccessful attempts at separating spithelial adhesions, and the cicatrization of circumcision wounds are apt to render the edges of the prepare unduly rigid.

The symptoms of phimosis may be both local and general. Irritation by contact with urine and pourling of the presuce by mechanical retention are quite frequent. Smegura becomes rancid when the original epithelial adhesion has been separated. Retention of unne, or incontinence, or both combined, is often met with. The former and the spastic dysuria produced thereby result in straining, vesical symptoms resembling those met with in vesical calculus, prolapsus of the rectum with more or less constant tenesmus, the protrusion of hernia, and the formation of struma. Like balanitis, which is frequent, costitis and hamaturia will occur. The local irritation gives rise to erection, sexual excitement, and musturbation in the youngest of infants. Headaches are said to be frequent but mostly tenperary, and permanent nervous symptoms in great numbers have been attributed to phimosis. It has become quite customary, though less so to-day than ten years ago, to attribute severe nervous derangements to it. A London neurologist has gone so far as to make the statement that in twenty-five cases of epilepsy he found congenital phimosis eleven times. Probably it was the spurious variety of "phimosis," which may be reduced. The so-called reflex paralysis from genito-urinary causes has played and is still playing an important (?) part in American pathology. Numerous cases of infantile unlimmelitis and cerebral paralysis, spastic paraplegia and paralysis, chorea, epilepsy, contractures, and idiocy have been explained (?) by the presence of phimosis. The numerous cases alluded to above of alleged phimosis, in which the separation of the preputial adhesion and apparent phimosis was easily accomplished, were frequently such as had been condemned to be operated upon for a serious spinal or cerebral disease. There was a time when, in a New York medical society, one of the sponsors of the theory of genito-urinary reflex paralysis and consecutive poliomychtis related cases of contracture and convulsions. When reminded that his cases were convulsive and not paralytic, he retorted that he was no physiological theorist, but he cured his patients. In another meeting, years afterwards. I stated that I had never been a case that PHIMOSIS

obliged me to assume a causal connection between paralysis or contraction on the one hand and phimosis on the other, and was sustained by neurologists of rank, who also denied ever having seen a case which necessitated the assumption of a genito-urinary etiology. Still, the hughear is alive, many a prepace is sacrificed, many a fee pocketed, many a diagnosis not made, and many a case either prograssinated or not cured.

Most instances of moderate phimosis are best treated by the gentle method of gradual retraction, some are improved by the normal erection occasioned by micturition and other causes. For these reasons dozens of years ago an experienced pediatric surgeon (Guersant) stated that he seldom operated for phimosis before the fourth or fifth year. Foreible dilatation, if resulting in fissures of the edge, must be frequently repeated to avoid hard cicatrization and consecutive contraction. Many such cases, however, are served better by circumrision. Those which are not amenable to mechanical treatment require the knife. The incision of the inner lamina alone, which has been recommended, is very apt to be incomplete, though painful, and to lead to swelling and imperfect results. The atrophic variety requires a dorsal incision by either a knife, carried on a director, or a pair of seissors; the inner lamina is often not thoroughly divided. and requires the repetition of the incision; when the scissors cannot be carried over the whole length of the glans, it has become necessary to first cut down on the corona glandis to enable the operator to carry the seissors over the entire length. The cut edges are mostly subjected to Kocher's continuous auture, and the whole surface treated antiseptically with bismuth (dermatol) and an aseptic dressing kept moist with a mild antiseptic, boric or boro-salicylic (Thiersch's) solution. Iodoform and carbolic acid should be avoided. corners are mostly rounded off. This is particularly necessary in the cases of hypertrophic phimosis which are subjected to the same surgical treatment. Most of this class, however, demand complete circumcision, care being taken that more is removed of the dorsal prepute than of the opposite side, that the inner lamina is separately divided afterwards, and that the epithelial adhesion is carefully separated. The prepace must be drawn forward sufficiently to protect the glansagainst being injured; more than once I have seen it mutilated. In one case the mutilated glans became infected with diphtheria. The wound must be sutured and treated antiseptically. One of the saddest cases of my whole life, and one of persistent distress, was the death from ervapelas from that simple operation performed on a how of three years. Infections of circumcision wounds by bacteric poisons

are quite frequent; cases of diphtheritic invasions I have published in my treatise on diphtheria (a880), and before that in the second volume of "Gerhardt's Manual" (a876); many more I have seen since; and syphilis and tuberculosis have been known to follow many instances of either surgical or, more frequently, ritual circumcision.

Diphtheria of the prepace, or rather of the genito-erinary organs in general, the female included, may occur as an originally local affection -such as those alluded to-or as a part of the general infectious discases. The latter are mainly diphtheria, scarlatina, and measles. The last named is the very malady which appears to predispose the system to the most vehement forms of local invasions. The aphthosa reduitir of little girls, and noma, are mostly found after measles; and diplitheria, when found after the same eruption, is more upt to destroy life, with general symptoms, than under ordinary circumstances. In many cases of localized diphtheria, however, the constitutional symptoms are but few, provided effective local treatment is immediately resorted to. Absolute cleanliness of the parts (sponging and bathing) is first in order; after that, local disinfection. Applications of limewater will suffice for mild cases; solutions of one or two parts of zinc sulphocarbolate in one hundred of water, or from one- to five per-cent, solutions of aluminum aceto-tartrate in water, will act well These two may be used to advantage as a vaginal injection in the case of the smallest girls. The needle of a small hard-rubber or glass syringe should be lengthered by a thin India-rubber tube, from half an inch to an inch long, which passes the hymen easily and permits an irrigation of the otherwise inaccessible parts. In many cases solutions of mercaric bichloride proved successful: for occasicual applications, of one in from three to five hundred of water; for frequent use, of one in from two to five thousand. In exceptional cases, however, it is not well borne and frets the surface. Indoform as a powder, or in from eight to fifteen parts of vaseline, has rendered very effective services. Boracic acid avails but little.

Notes of the vulva and vagina requires more determined local treatment, besides assiduous robotant and atmulant administrations. Mineral acids in full strength or strong solutions of corrosive sublimate have proved efficient in many cases in which the progress of the disease was not too rapid. I have had most successes with the actual cautery. Pyoktanin, when used in cases of nome of the face and of the vulva, was absolutely worthless.

Paraphinson's results from manipulation. The separation of the epithelial congenital adhesion and the dilatation of a phimmis are liable to be followed by ordernatous swelling. In both cases the pre-

puce should be replaced over the glans. If that he omitted, the prepace—relatively long in the child—will swell, and may become gangrenous. Fortunately, the penis itself is not often drawn into that process. For the purpose of reduction, the glans penis, which is considerably swelled, is persistently empressed while the prepure is drawn forward. A good deal of force is sometimes required, and not infrequently an amenthetic. Sometimes gradual compression by hundages (cotton or rubber) must precode the attempt at reduction; in some cases, however, a careful incision of the prepuce, the more careful when no director can be introduced between the glans and prepuce, in misovoidable to relieve the constriction.

The treatment of the more common forms of balantiz and balantparthitiz, occasioned by the decomposition of smegma, or by masturbation, or gonorrhoez, or trauma, such as the constriction of the organ by a string, is not always quite simple. When there is much redema it may become necessary to incise the prepuce to get at the sore surface. In most cases, however, astringent or disinfectant solutions can readily be applied either directly or through a small syringe. Solutions of lead acetate, sine sulphase, alum, tamin, rine sulphocarbolate, or aluminum aceto-tartrate can be employed in different strengths, also potassium permanganate (1 to 1000 or 3000). Among the poor, when assistances attention is out of the question, ointments to powders are preferable. Ointments for this purpose are best made with vaseline. Warm bathing and sponging with moist absorbent cetton will improve the chances of a rapid recovery.

A similar local treatment is adapted to the outpur and oughtel caterrà of both the adult and the infant or child. It is very common among the latter, and quite obstinate because of the comparative inaccessibility of the parts, no matter whether the catarrh is simple. or specific. The latter occurs even in the newly-born; the causes of the former are very various. A predisposition may depend on that structural debility, with elmonic inflammation of most tissues, which we are in the habit of calling scrofulous. Local exposure to · cold, sitting on house-stoops, the irritation brought on by masturbation or by foreign bodies,-mud, cotton, carpet-fuzz, glass, wood, all of which I have found in the narrowest vagine; also oxyuris emigrating from the rectum, the use of soiled cloths and towels, and the gross neglect of the most urgent cleanliness, with the possibility of directly importing bacteria coli, are among the most frequent causes of vaginal catarrh. Specific vaginal catarrh (gonorrhosal colpitis with its diplococcus and others) is by no means rare. The infection, though most often indirect, and conveyed by towels, bed-sheets, but

also by immediate bodily contact (mostly in institutions which formish those cases in large numbers as a dispensation of providence), Irequently gives rise, even in the smallest children, to glandular smallings, endometritis, parametritis, salpingitis, cophonitis, and personitis, also to urethritis, though the latter appears to be less common in children than in adults. Endometritis with its results is liable to be very obstinate; for while the cervix is growing in length up to the fifth year, the endometrium remains folded upon itself many times. Only between the ninth and tenth years (not always then, so that dysmenorrhota may depend upon this infant condition of the merus) are these folds smoothed out. Thus the great danger of a gonorrhotal endometritis becomes evident. The treatment of urethritis is not necessary when (as happens frequently) the urethra takes no part in the generation of the vagina. That contagion should take place through the air, according to Bouchard, I have never been able. to observe. Besides the local treatment, in conformity with the details given above, absolute cleanliness of the body and clothing and frequent (general and hip) baths are required. Masturbation must be guarded against and foreign holies sought out and removed. Rectal occupides require injections with water, vinegar and water, garlic decoctions, or cod-liver oil. They must be resumed after an intermission of weeks because of the repeated immigration into the rectum from the upper parts of the intestine, where the nematoid has its habitat. In gonorrheeal cases the transmission of the virus to the eyes and to other persons must be guarded against. To reach the recesses of the vagina, partial or total removal of the hymes has been advised; but I have met with no such brutal indication. Besides the solutions enumerated above, silver nitrate has been advised. I have used it, in solutions of one in from five hundred to a thousand, in a number of cases of ulcerative catarrh, also argonin in from one- to three-per-cent., or proturgol in one- to two- or more percent, solutions. In some the restitution of the superficial losses of substance appeared to be more rapid. In stronger solutions and solid it has been employed in tuberenlar picerations, in reference to which I have no experience. In many cases of vaginal catarrh the surrounding parts are sore and suppurating, or eczematous. Lead or hismuth ointments, or hismuth pourder, with or without salicylic acid. will effect a cure in that complication.

A frequent result of vaginal catarrh of long standing is a moterate degree of atracks of the vagina. It is usually of a superficial character only, and can be remedied by tearing the adhesion with both hands, or by piercing with a probe and dilating the artificial opening. Astringent applications, or those of dermatol cintment (4 to 6 or 8), will prevent the renewal of the closure. Diphtheritic inflammation of the vulva and vagina I have known to result in pretty firm occlusion. In one case the reopening required some force and the continued use of bougies and astringent applications to prevent a repetition of the union. The imperfevate condition of the hymon, mustly congenital, is often the same process of epithelial and inflammatory cohesion accomplished during fortal life. According to its early or later formation, and according to the presence or absence of vaginal complications, it requires either the probe or the knife. Such a complication is mostly the result of either an arrest of development or an inflammatory multomation. An early adhesive inflammation of the vagina will obstruct it in its entire length, or a transverse obstruction of the ducts of Müller may result in an absence of the vagina below the external os uteri.

Paginal honorrhage of a mild degree has been observed in the newly-born, without any complication, least so with bleeding from other organs. It is mostly very slight. In masturbating infants and children, and in some of those who suffer from a severe vaginal catarrh, some blood may be noticed. It requires no special treatment; nor was there an indication or an opportunity to interfere in the very rare cases of genuine menstruation in the very young which have been reported.

In connection with vaginal catarrh I mentioned marturbation as one of the causes. Still, it is not only a cause in some cases; in many others it is its effect. Indeed, masturbation is so frequent that a few words on the subject may be deemed permissible at this place, in addition to my former discussion of the subject (Arch. Ped., April, 1890, and Amer. Journ. Dis. Ch. and Women, 1875) That habit. like its precursor, the sucking of fingers, often semi-conscious, is very frequent in infants and children; more in girls of the earliest infancy, more in boys of advancing years, and there is a variety of causes leading to it. Such are local irritation (sometimes by nurses). of the genitals in the very youngest, excitation in those older, featherbeds, excess of animal food and stimulating beverages, rancid smegma under a long or a narrow prepute, emptions on the penis, vaginal and vesical catarrh, renal calculi, eryptorchis, preputial adhesion, phimosis, expuris, and constigation. Among remedies, I recommend the relief of the causes as enumerated and partly alluded to on previous pages: cooling dist and cool coverings, attention to the kidneys, bladder, and rectum, relief of external irritation caused by clothing, mainly by misfit trousers, immediate removal from the bed

upon awakening, no sleeping with bedfellows, cold bathing and sponging, mechanical presention, and timely punishment. Long school hours and study, without long recesses, should be avoided. Allow no child to remain in his seat during recess; see that he has his hands on the table and that his body is visible. Give him no side pocket in his trousers. Teach him with an occasional researk, but do not harp on the subject to any length. Watch protracted convalescence with its constant lying abeil while awake. Those who ride on horseback or on the bicycle should be watched; some will have erections at once. Goltz places the erection centre about the fourth Impfor vertebra, others in the polaneuli cerebri and medulla oblongata. When there is a central disease, treatment may be useless. Even operations like clitoridectomy, or the application of vesicatories, have no effect on them. A girl of nine years was maximisating almost constantly by directing her mind to her voluntious sensations, and admitted that she would not stop. Such bad cases cannot be reached by medication. It consists in ample doses of camphor, memobromated camphor, lupulin, bromides; also in a sufficient doss of chloral bydrate for children that sleep interruptedly (hypotism?).

Cryptorchic is the absence of the testicle from the scrottm. Normally it descends in the minth mouth of utero-gestation, or during the first weeks of extra-uterine life, but sometimes at a later period, or not at all. In the latter case, particularly when incorcerated in the canal, it is apt to undergo in later life malignant degeneration. When in its descent it gets under the femoral arch, resembling a crural hernia, or to the perinsum, it is subject to inflammation, and requires the application of ice, and occasionally a local depletion, or a puncture for the relief of effusion, and sedatives for the removal of reflex convulsions. In most cases of incomplete descent the testicle is found in the inquinal canal, and slightly movable; it may be complicated with hernia. No matter whether this complication is present or not, the treatment consists in the application and constant spearing of a truss so adjusted as to keep the testicle below and the intestine above. Its effect can be enhanced by frequent and gentle massage. This simple treatment, if started very early, I have found effective in so many cases that Ashby and Wrigin's advice-not to rely on it, bett to operate and either fix the testicle below or remove it altogetherappears to me inappropriate in the very young. If, however, a result has not been accomplished in time, or if no attention was ever paid to the anomaly, it should be urgently advised to perform orchidopex) between the tenth and fourteenth years (before puberty), or earlier if there be a homix. If that he done, the testicle will develop:

if not, its atrophy is inevitable, or malignant degeneration may take place.

Orakitir is occasionally found in children. The acute form is either traumatic or alternates, even in the infant, with pareitie, or no cause is obvious. The treatment must be conducted on general principles, and consists in the local use of ice, of purgatives, and, occasionally, of antipyretics and narcotics. Locales resulted, in a few of my cases, in extensive swelling of the scrotum. Chronic orchitis is mostly combined with epididymitis, the result of trauma combined with a scrofulous disposition. It is apt to lead to induration, caseation, and tuberculiration. If that occurs, the organ ought to be removed to aroid general tuberculosis.

Primary interculosis appears to begin mostly in the epididymis, and requires removal, as well as derinoide, airconaide, and careinomist. Of the latter, I saw a case in a boy of four years. It was removed and no new local trouble arose; not even in the lymph-bodies of the neighborhood. But the disease reappeared in the langs. Both testicles and ovaries are more subject to congenial tumors than perhaps any other organ, with the exception of the kidneys. Wolff (Deutsche Zeit. J. Chin., 1899, vol. liii) collected two cases of sarcoma of the prostate under one year, three from one to ten, three from twenty to thirty. Secondary (?) miliary tuberculosis was observed by Neureutter (C. Springer in Zeit. J. Heilhunde, 1902) in the vagina complicated as follows: with universal tuberculosis (girl of four-teen), with tuberculosis of the uterus and tubes (girl of eight), with that of the uterus, tubes, lymph-bodies, intestines, lungs, and laryus (girl of eight).

Syphilis of the testes requires a strict antisyphilitic treatment. There is the indication for the internal administration of mercurials and indides; in the first few weeks a daily hypodermic injection of a soluble mercurial salt will improve the chances of recovery.

Hydrocele is of frequent occurrence. A few drops of serum are normally found in the tunica vaginalis propria. Larger accumulations of serum are met with in more than ten per cent, of all male infants,—mostly on the right side, seldom on both. In the majority of cases there is no longer a communication with the abdominal cavity. When it remains, a bernia may complicate the hydrocele, and the diagnosis may be more difficult because, in such a case, the fluid is apt to return occasionally into the abdomen. Spontaneous absorption is not very rare, but supportation incommon. I have injected alcohol and diluted tincture of iodine, and setoned the scrottim with either silver wire or sile. All of these methods are bad to begin

with. Simple punctures, one or more, made once or repeatedly with a sterilized needle or trocar, will allow the escape of the finid, which frequently does not return after the first procedure. It is heat to dislodge the integration a little, so as to have no direct escape of the serum. If there he a relapse, however, after a number of punctures, the injection of a small amount of tincture of sodine, or of Lugol's solution, or of two or three drops of carbolic acid, after the fluid has been withdrawn, will prove successful. Radical operations are rarely required. The cases in which the communication with the abdominal cavity is still patent require the application of a truss after the scrum has been allowed to return to the abdomen, or a radical operation (Bassini).

A hydrocele of the spermane cord is either congenital (the result of non-conglutination of the pars vaginalis peritorari) or caused by an inflammation of the tunica vaginalis, of the testicle, or of the spermatic cord. It may be let alose or the fluid aspirated.

The paradoplasma of the young female mogenital organs offer no special indications of their own. Tumors of the ovaries were mostly formal, on operation, to be dermoid cysts, and very rarely carcinomatous or twicecular. The latter and acrossus, of which d'Arey Power collected from literature twenty-five cases (St. Barthol Hosp Rep., vol. xxxi), are rare occurrences in the young vagina. Cysts have sometimes been found above the hymen, and soft polypi more frequently in the needra. They are either easily recognized or untaken for a simple prolapse of the meetinal mucous membrane. They sometimes give rise to vesscal tenestrus and dysuria, and also to (mostly slight) hemorrhages. Exulsion, chromic acid, the scissors, and the actual cautery, now and then two of these means combined, have been used. Ligature never succeeded in my hands. It would always cut through at once, produce some bleeding, and necessitate some other method.

IX

Diseases of the Respiratory Organs

1. The Noves,

Acute nasal cutareh (acute catarrhal rhinitis) is found either as a sporadic or an epidemic aliment; the latter rarely depends on erysipelas, still less frequently on gonorrhou, more frequently on influenza, measles, or whooping-cough. The mere presence of numerous microbes of different varieties is of no account; so long as the surface is fairly intact, the nasal mucus is bactericide to a great extent, and invasion does not mean infection. The sporadic form is sometimes local and unilateral; in that case it has a local cause, such as a traumatic lesion or a foreign body; when bilateral and general, it is mostly the result of sudden thermometric or barometric changes, or exposure to dust, impure or dry furnace air, etc. In rare cases the irritation of trifacial branches of the maxilla will, when dentition is really abnormal or unusually difficult, give rise to vasomotor and secretory changes of the nasal mucous membrane, which is supplied with ramifications of the same nerve. Acute nasal catarrhmay be attended by high temperatures, considerable swelling, and obstruction (thus rendering respiration extremely difficult, particularly when the patient is newly born or quite young), and by secondary affections, such as swelling of the cervital lymph-hodies, acute pharyngitis, amorgidalitis, conjunctivitis, otitis, headaches, and sleeplessness. The indications for treatment are various; the local hypernemia and swelling are to be reduced, the secretion removed, the fever

There appears to be no specific cause of nasal cataorh, as might be expected.

^{*}According to R. O. Neumann (Zeitsch f. Hyg., vol. xl., 1902), the normal tose contains a large number of microbes: microcccus pyogenes alless in from eighty-six to ninety, and the bacillus pseudodiphthenia in ninety-eight percent of all cases. In nasal enterth there is a relative increase of the bacillus pseudodiphthenia of Praeslod and of Friedlander, of atreptococcus pyogenes and of the bacillus of diphthesia. The bacillus pseudodiphthenia is a suprophyte only, and has so relation to usual catarrh; but virulent bacilli of diphthesia (and those of Fraeslock) may cases it. Thus my statement that many cases of usual catarrh during an epidensis of diphthesia were diphthesitic—first based on clinical observations in 1860 (Amer. Med. Times)—is confirmed by the most secunt bacteriological researches.

relieved, and secondary affections either presented or treated, among them all those occasioned by the unfiltered condition of the air admitted to the respiratory organs through the mouth.

Hyperamia and swelling may prove dangerous to very young babies. In them the misal cavities are narrow, and so easily obstructed by an acute catarrh that now and then a newly-born infant that has not yet learned how to breathe through the mouth, in which the tongue is earled up, is in danger of suffocating. That narrowness is universal. In the newly-horn and the unfant the lower coucha closely hugs the lateral wall and contracts the lower masal mentus. The middle misal duct is somewhat larger and straight, almost obstructed in front, and circular (very much smaller and more irregular than in the adult); the auterior blust end of the middle coucha lies or the upper margin of the lower. The whole mosal cavity is narrow. At the level of the eyes the latitude of the nasal cavity compares with the width of the face as one to three and a half in the adult and only one to four and a half in the newly-born. In him the septim is more horizontal, in the adult almost vertical. The anera are scarcely perceptible, with a narrow slit in place of the nearly spherical orifice of the adult. Of congruinal chatraction by assingation of the posterior msal orifice Boulay collected sixty cases (Rev. Most., 1901). The only relief is by operation at a rather later period of life.

Some of the cases of acute rhinitis require constant attention thay and night the month most be kept open by gentle pressure on the chin to enable the little patient to breathe through the month until the nares become pervious. Particularly in cases in which the mucous membrane is thickened from birth, or a nasal polypus is present, or a swelling of the plaryngeal or the palatine tonsile, and adenoid enlargement, the danger of sufficiation is great. In a single case I have been compelled to repeatedly apply the galvano-cautery to the left masal cavity of a newly-horn whose acute catarris obstructed the narrow channel. Astringent solutions are indicated for a similar purpose, or ointments which may be applied by means of a ramel's-hair brush. Still, I cannot express much satisfaction at the effects obtained, for the reason that whatever is not quite indifferent to the mucous surface will irritate and increase the trouble. That is what is done by high or low temperatures of an injection -a good medium is about 90" F .- and by most astringents enless in a very mild solution. Better is a two-per-cent, solution of cocains hydrochlorate, which may be applied with a brush or by means of the atomizer, from time to time. A freshly prepared solution (suspension) of afrenal powder in water (from five to ten per cent.)

will not cause the secondary hypersenia lollowing the use of cocame. Camphor inhalations have been praised, and powder containing a few per cent, of membel. The secretion must be removed now and then by wiping out the nose and bringing on sneezing. the wiping out may be done with a probe covered with absorbent cotton, the latter to be introduced horizontally, either dry or mostened with an alum or cocaine solution. The passage may also be kept open by a physiological sait solution (1 to 150), or an astringent, or a disinfectant wash of ainm, zinc sulphate, bismuth subcarbonate, or horacic acid. The latter is not always satisfactory. In most cases, it is true, it acts very mildly, but now and then I have soon catarrhal secretions increased by it. These applications may be made in different seays. An atomizer, when the nouzle is lengthened with a short piece of India-rubber tulong, will do no harm; nothing that is bard or pointed should be used for a nostril; injections should be made very gently and slowly, else they are liable to injure the ear; irrigation by merely emptying a pipette or a small spoonful of a solution into the nostril will prove uninjurious, but not very efficient. As a rule, I prefer a nasal cup, which should not be emptied at once, so as to allow ample breathing time. In the newly-horn, on account of the low condition of its reflex activity, smuff does not act so readily as it does in more advanced age; but it may be tried for the purpose of emptying the sares. Otherwise the rational general treatment of a catarrh may be resorted to: moderate temperature of the room (from 68° to 74° F.), moist air when the secretion is thick and viscid or scanty, an occasional warm bath, a dose of quinine about noon if there be a considerable rise of temperature in the afternoon, an occasional dose of phenacetin or antipyrin during the day or small doses of the tincture of acouste at intervals of two hours; probably a single dose of opium as a sedative and diaphoretic, late in the evening. Dover's powder, from one to two milligrammes (one-sixtleth to one-thirtieth grain).

Chronic name cutarrils derives its therapeutical indications from its many occasional causes; for instance, frequent returns of acute catarril, disety, cold, and moist air, also dry furnace air, the presence of a foreign body, or the deviation of the septum. This latter condition may be congenital, even herefitarry, due to unequal development of neighboring, mostly the turbinated, bones. The somer does not fully ossify until puberty, and is therefore long dependent on the facial bones, "whose evolution leads to irregularities in the higher races, less in the negro" (Kohts), or due to a fracture of the septum, or to its disruption from the etheroid, or somer, or superior maxilla. It results in obstruction, and behind it in accumulation of muces which is disintegrated and irritates. Other causes of chronic mosal catarrh are enlarged tensils, chronic pharyngeal catarrh, and adenoid vegetations, with their diamaging influence on respiration, digestion, the sense of smell and taste, and intellectual development. Scroinia, tuberculous, and syphilis, with their effects on mucous membranes, bones, and cartriages, are frequent causes of chronic mosal catarrh. Less frequent are the effects of furniculosis, which here is parer than in the adult; of croupous inflammation; of diphtheria of the nose, which may be met with independently of planyngeal diphtheria or may other it in; or of eczema of the upper lip.

Syphilis, tubereniosis, and scrolinla have their own indications. Thus, a chronic rhinitis occasioned by them demands mercure, arsenie, crecoote, cod-laver oil, iron, or phosphorus, according to general rules. Abscesses are to be opened, the small necrotic bones removed. furniscles incised. They should be treated early, for cerebral embolism I have known to come from them several times in my life. The easenlar connection is very intimate, for the anterior and posterior ethnoid veins enter the cavernous sinus either directly or by means of the superior ophthalmic year. Foreign bodies must be extracted, adenoid vegetations removed, and hypertrophical tonsils resected or occasional cases-treated with the galvano-cautery. Many a case of chronic mosal catarrh will be relieved, or nearly cured, by these measures, or, on the other hand, there is many a case of chronic pharyngitis which gets well through the treatment of the most catarrh. Indeed, there are very many of these complications in which the determination of the primary seat of the affection is very difficult or even impossible. If there he a considerable deviation of the septum, not to speak of the excessively rare cases of bony union, it must be corrected. In very young infants that correction can sometimes be accomplished by manual pressure. The cleaning of the nasal cavities is of at least as much importance as in acute catarril. They must be washed out from two to four times a day with some warm duid. According to the case, this may be salt water, or a solution of boracic acid (from two to four per cent.), or alim (balf per cent.). The same precautious should be used which were advised above. If larger quantities of the fluid he used, the injection should he made very gently and the child taught to keep his mouth comformbly open. Potassium chlorate has been employed in solutions of from one to three per cent.; resorcin, of two per cent.; creason has been applied similarly; loding or tannin in combination with glycerin. Cocaine solutions have been employed with good results.

Their immediate effect is evident, and they are better than a merely comporary makeshift. What I have seen do a great deal of good is silver mitrate. A solution of 1 to 250 or 2000 may be sprayed into the masal cavity once a day or every other day. When a carious bone is underlying the chronic catarris, an iodoform ointment (1 to 8 or 15 vaseline) may be applied several times a day to advantage. Hypertrophy of the innous membrane and submucous tissue, with ulcerations or granulations, adds greatly to the difficulties of the case. Lactic acid in powder or in strong solutions has the reputation of destroying morbid tissues, mainly granulations, and of leaving the healthy tissue intact. Still, I cannot say that it has rendered me very appreciable service in cases I considered adapted to its alleged powers. The exuberant tissue will, however, be beneficially influenced by an application every few days of a solution of iodine (1 to 8 or 1 to 4), of iodol or aristol, of bismuth softcarbonate, of a strong solution (ninety per cent.) of carbolic acid every four or five days, of chromic acid once every week or ten days, and last and fiest, of the galvano-cautery under cocaine unjesthesia. For the purpose of compressing the swelled soft tissues and correcting a deviation bongies are also used, made of zinc, tannin, or carbolic acid. Chromic acid and the galvano-contery are my preferences in the worst classes of cases; for instance, those of account even in children, sometimes complicated with antrum disease, and very commonly complicated with or depending upon an excessive width of the posterior nares, like utrophic rhustis, attributable to or connected with undue patency of the nasal orifice and of the nasopharyngeal vault (Lennox Browne, Philad, Med. Jour., August 20 1800), do well under their influence. Others require the frequent use of stronger solutions of silver nitrate as a spray, or potassitim hypermangamate solutions (1 to 1000 or 2000), or iodol or aristol insuffations, or a combination of a few of these remedies. For the surpose of cleaning the nasal cavities docile children may learn how to employ the rasal douche for copious irrigation. The douche (fountain syringe) should never be raised more than a foot above the level of the nose, the fluid should be mild (salt water) and nearly of the temperature of the body, the head gently bent forward, the teeth parted, and respiration should not be interrupted by swallowing or coughing. If this happen, the tubing of the instrument should momentarily be compressed. Donile children may be taught to permit the flow of the fluid during inspiration only, the tube being compressed during expiration. The nextle should be introduced horizontally into the narrower nostril. If sneezing comes on, it should take

place while the mouth is kept open, and blowing the nose should be done with one nostril open.

Polyps, either congenital or acquired through chronic cararris. though not frequent, will be met with in every medical practice. They are either soft and consist of mucous membrane, or harder and composed of dense connective tiseae. Those with an admixture of sarcomatous tissue (not often round cells, more frequently spindleshaped cells with copious strong) are relatively rare. (Of princey arrested of the nose, Th. J. Harris (Phil. Monthly Med. Jour., Ime. (839) quotes one hundred and three cases. Of sexty-two cases whose ages were known, one was four, four users nine, two eleven, and two sixteen years of age.) The cold or galvano-camers stare is required by those which have a rather bulky pedicle. Evulsion with a common polypus-forceps suffices for those which are distinctly pedmentated and for such as consist in the main of mucous membrane. A firm tampon is seldom required by excessive hemotrhage after evalsion. In most cases the bleeding ceases spontaneously; or a tampon of moderate size covered with powdered alian or tannin is demanded; or the cauterization of the strong with chromic acid, either dry or in a concentrated solution, by means of a camel's-hair brush or a probe covered with absorbent cotton. This application may be repeated after a while to guard against a return. Or a watery antipyrin solution (from twenty to fifty per cent.), or a spray, or the application of the powder of adrenals, or their solution in water.

Foreign bedies are often found in the nasal cavities of babies and older children. Paper balls, shoe-buttons, dry peas and beans, flies and bugs, cherry-stones, and beads are readily admitted. Their diagnosis is by no means always easy. Chronic catarrh, being their usual result, gives rise to the mistaken diagnosis of carios, ophilio, to tumor. The cases in which the presence of a foreign body causes delirium and convulsions, and may be taken for meningitis, are, fortunately, rare. In many, chloroform anaesthesia is required to ascertain the mature of the difficulty. The consecutive cutarrh and ulceration require mild or disinfectant washes or injections. The car-spoon. or Daviel's speen, or a woman's hair-pin will generally suffice to dislodge the foreign body. While the child is firmly held, the operator, standing a little behind and on one side of the patient, introduces the instrument from above downward, the cavity looking for ward. In this way the foreign hody is easily scroped out. When the symptoms are urgent (consulsions, high fever), an ala mass has been incised to facilitate the required extraction. Dr. G. Biron recornmends the following method (Ped., July 15, 1867). The child

is placed in the ordinary position for intubation, the assistant hobling his hand firmly over the child's mouth. One end of a piece of rubber tubing is sough inserted into the nostril opposite the one holding the foreign body, the other end is taken in the operator's mouth. The operator then blows suddenly and vigorously into the nostril and dislodges the foreign body. This method should not be employed, however, if it be too firmly impacted; for in that case foreible insufflation might injure the middle ear. In every case the mouth should be tightly closed.

Epistaxis depends on the rupture of one or more blood-ressels, either large or small, normal or abnormal. The Schneiderson membrane is succident and replete with blood; that is mainly so in the respiratory part about the lower and middle conclue, where the cavemons tissue is located, and the large veins are controlled by the spheno-palatine ganglion. A normal blood-vessel may bleed in comsequence of a transactic injury, or of an erosion by elironic catarrh. efectation, diphtheria, or syphilis. Blooding from the sose may point to the presence of a polypus, or be the indication of obstruction in distant parts of the circulation in the abdomen, the lungs (chronic pneumonia, emphysema), the thyrold body, or by cardiac disease. The compression of the abdominal viscera by enforced confinement in the school-room, overheated and ill-ventilated at that, and consecurity constitution are frequent causes of eristaxis. Blood-vessel walls become abnormally fragile in constitutional and infections discases, such as early chlorosis, ruberculosis, hamoshilia, leucocythamia. general anyloid degeneration, purpura, scurvy, and typhoid fever-Perhaps the most obstinate form of epistaxis, which is, fortunately, infrequent, is that which depends on the congenital incompetency of the heart combined with smallness of the large arteries, and results. in the most serious cases of chlorosis. All these different causes of epistaxis suggest their own indications. The constitutional diseases resulting in local hemorrhage demand such management as has been indicated in other parts of this book. All of them may require local treatment besides. It is obvious that in every case of epistaxis the congestion of the nasal mucous membrane must be siminished if possible, and the formation of a clot should be facilitated. By raising the arms over the head, and by forced inspiration, the chest is expanded and a large amount of blood accommodated in it; hot handand foot-boths have been resorted to for a similar purpose. Ice may he applied to the neck and throat, and pieces of ice introduced into the bleeding nostril. The local use of water (injection, washing) is not desirable, inasmoch as it is liable to prevent the congulation of

the blood on the bleeding surface. Solutions of alum or tannin will answer a little better. The use of a tampon is often required to stop the loss of blood. The introduction of a wick of absorbent corton or fint, by means of a pair of line pincers, or, better, by foundy wrapping it round a smooth probe (whalebone or other), or of the same covered with alum or tannin, or souked in a solution of iron perchloride or subsulphate ("hemostatic cotton"), combined with pressure from outside, or in an antiporin solution (from twenty to fifty per cent.), with or without tannin, will sometimes prove satisfactory. So will applications of adrenal powder in substance or in solution, or the local application of a thoroughly sterilized ten-per-cent, solution of gelatin. In but a few will it be found necessary to close the whole cavity from either side by means of a tampon introduced through the mouth into the posterior nares, at the same time obstructing the nose anteriorly. Bellsog's tube should not be used for that purpose, as it tears or cuts the tissue. An elastic catheter is easily carried through the nose and mouth, and the tameon attached to in This procedure is not so annoying and irksome as it appears to be, because it is in few cases only that most-bleeding is bilateral. In rebellions cases of older children the local cause should be locked for,-viz., an ulceration extending into blood-vessels. Ulcerations of the septum parium are not frequent in children, but they will occur.

Chronic catarrh and isloration of the sares must be treated according to the principles taught above, and the most frequent causes of epistaxis among children attended to according to their own indications. Local ulcers may be reached with silver nitrate, the stick or a solution. I cannot impress too much the necessity of attending to the intestinal congestions and disorders of school-children. Constipation of a lifetime is often the result of the cramped postton on an improper chair or bench, and of the inability to exacuate the bowels at the proper time. Children suffering from constitution, particullarly those who are affected with what I have described as congenital constitution, may require a faily injection and may be benefited in targent cases by an occasional (vegetable) nurgative. This is sometimes all that is required to relieve their epistaxis. That many are relieved only when taken from school and allowed the free me of their limbs in the open air is self-evident. Another large class of pose-blorders is that which originally suffered from chronic purpmonia or chronic heart disease with general and persistent anemia. Very many of these cases improve instantly under the sufficient use of digitalis, in efficient doors, and mm.

2. The Largen.

Acute laryngéal catarrir (acute laryngitis) is too common a discase to justify a discussion here of its etiology or diagnosis. In regard to the latter, I refer to a single point only,-viz., that of the temperature, which is always elevated. An incomplicated acute largegoal cutarrh is always attended by fever, while an ascomplicated laryngeal diphtheria (" pseudo-membranous croup") is not so accompanied. Dozens of years ago I brought out this fact, and a large experience has since confirmed that observation. The other symptoms are unmistakable, from the different degrees of dyspaces to those of hoarseness or aphonia, and the burking cough, which is quite characteristic and easily differentiated from that of other diseases of the respiratory apparatus, or from the reflex cough caused by foreign bodies in the naso-pharynx or in the ear. The treatment requires the most perfect rest. Talking must be prohibited, crying avoided, if possible. For that reason, if for no other, opiates are indicated; partly to relieve the local irritation which produces cough, and partly to secure sleep for the purpose of equalizing circulation and resting the excited muscles. The temperature of the room ought to be equable (from 68" to 75" F.), the air moist. The latter eases the large windpipe and procures rest, while dry and cold air increase the irritation. Whatever beverages are given should be warm. A general searm bath, warm applications (bot water, ponitices, sold applications which are permitted to become warm and are then changed), are both pleasant and beneficial. Plenty of water ought to be furnished, mild alkaline mineral water by preference. An infusion of ipecae with sedium bicarbonate, in small and frequent doses, will aid in liquefying a viscid mucous secretion.

The worst form of acute catarrh of the laryex gives rise to attacks of intense dysproca ("crosp"), which occur quite frequently in the night after the children have been asleep for some hours. The drying up of the pharyngeal mices is very apt to give rise to both cough and dysproca, and therefore it is a good plan to wake the patient suffering from pharyngeal catarrh from time to time sufficiently to make him drink. Average moisture of the air may not be enough. Water ought to be kept boiling constantly, so as to fill the air of the room (or a tent, which ought to be spacious) with steam. Spraying the throat with cold water is useless compared with the effect of warm vapors. That leeches, which I used sometimes in had tases of feverish and enoupous catarrh forty years ago, ever resulted in any good I am not prepared to say; but a promptly adminis-

tered emetic (special, zinc or copper substate, turpeth mineral, apomorphine) has often relieved the spasmodic dyspusus accompanying these (mostly nocrumal) attacks of "pseudo-cross," The effect of emetics, however, and their indispensability have often been exaggerated. Usually they are less required for the relief of the babies than for tranquillizing the fears of the mother and allowing the family physician to stay in bed.

Chronic laryageal caterrit may develop out of a protracted acitecatarris, or the affection may be primarily mild, but result at an early period in the thickening of tissue. Even at the earliest ago this process may be observed. One such case I saw with Dr. Hopkins, of Brook lyn, in a newly-born baby, which got well after the daily administration of a few grains of potassium iodisle, continued for several months. Constant warm applications, or cold ones which are permitted to become warm, will favor absorption. Cases which are complicated with, or perhaps dependent upon, a chronic pharyugeal catarrh are often favorably influenced by the use of tincture of pimpinella saxifraga, half a drachm or a drachm of which may be taken daily, in ten or twelve doses, in a solution of pomssium chlorate, in such a way that the dose of the latter be a camious one and the dilution (in water) of the tincture be not excessive. This drug has long been "obsolete," but deserves to be reappointed to its former place in practice. The majority of such cases will do well when treated with solutions of sodium bicarbonate or potassium iodide, also of ammonium chloride in daily doses of from eight to thirtygrains (0.5 to 20).

Dightheritic Lorengitis, Pseudo-Membrosour Croup.-It is not necessary to discuss here pathological questions, or to reassert the histological identity of diphtheria and "croup." When pharyngeal diphtheria has reached the larvax in its descent, or bronchial dishtheria resulted, in its ascent, in sudden laryngeal stenosis, the usual antidiphtheritic treatment avails but little. That neither general sor local depletion has any effect, except that of hopelessly reducing the patient's strength, has long been recognized; also, that venicatories add a new diphtheritic membrane on the surface to those on the mucous membranes. Emetics are of no use unless a peculiar flapping sound betrays the presence of half-detached membrane in the air-passages. In such a case they are apt to save life. At all events, I have never been so fortunate as to observe the universally beneficent effect which has been attributed to their frequent administration in an average case. Massage of the larvny has been recommended by Bela Weiss. I rannot say that the few cases in which I advised the

procedure were successful; it may be that the constant repetition of the advice to use mercurial or other ointments over the larynx is based on the observation of an occasional good effect of the fraction ("massage") attending their employment. Locally, lactic acid, in more or less saturated solutions, has been milogized as a solvent of the membeanes in the larynx, when often applied either by brush or spray. Most of the cases in which I have seen it used were not successful, but this untoward result is, unfortunately, not exceptional. I have seen, or believe I have seen, papavotin (1) dissolve membrane when applied in a mixture of glycerin and water (22 2). Particularly would that occur in pharyngeal diphtheria slowly descending. Limewater is still used as a spray and has its admirers. Lime slaked in a small room or under a tent is decidedly more effective, for during that process a large quantity of lime is carried up and inhaled; at the same time the softening and solvent effect of the steam is obtained. The latter is not always as beneficent as it appears. In many the application, externally, of cold water or ice-haps to the neck is vastly preferable. But in most cases of ascemic and highly nervous children the latter are not tolerated. Constant inhalations of turpentine, or encaloptol, or (in older children) carbolic acid, from a kettle containing boiling water, have impressed me as beneficial in a large number of cases. Inhalations, in a small room or under a tent, of caloniel, which is sublimated in doses of eight or ten grains (0.5). every hour or at longer intervals, are certainly effective.

The patient remains in bed as much as possible, and may continue such expectorants as he perhaps took for previous catarrhal symptoms; may also take diaphoretics and warm beverages, and an occasomal opinte for that indication and to procure some rest. The continuation of potassium chlorate when the invasion of the larynx is complete is rather superfluous. Antiparetics are out of the question unless there is a very high temperature depending on a complication (general diphtheria, pulmonary inflammations). Pilocarpine injures by debilitating the patient: the cases which are really benefited by it are excessively rare. Mercurials have resulted in more actual recoveries than any other internal treatment. The cyanide and iodide have been recommended. For twenty-five years I have employed the highloride in doses of a milligramme (one-sixtieth grain) or more once every hour. The smallest habies easily take one-fourth or one-third of a grain daily for days in succession. Almost never will a stematitis follow, and no gastric or intestinal irritation, provided the dilution be in the proportion of at least one in eight or twelve thousand. An occasional slight diarrives may require the

addition of a few drops of camphorated tincture of opinm. I will repeat a former statement, that never have I seem cases of croup getting well in such numbers, either without or with trachestomy or intubation, as with mercurial treatment. When this treatment proves imspecessful, intubation or tracheotomy must be resorted to. A small, frequent, and intermittent pulse, aphonia, cyanosis, and marked retraction, with every inspiration, of the supraclayicular fosse and the epigostrium are the indications for the operative procedure. I shall not here be terreted to defend the two operations; I shall not even stoop to discuss the criminality of allowing a child to suffocate without resorting to mechanical relief, or to compare the two operations with each other. I can only say that for years I have not seen a case in which intulation would not take the place of tracheotomy, and have therefore not performed the latter. Intulation has come to stay! It is not one of the many temporary devices which have been brought out to be instantly forgotten. In most cases it takes the place of tracheotome; in none does it make it impossible when, in the opinion of the operator, required. The latter operation may be preferred or become necessary for the purpose of getting at the trachea and bronchi for the mechanical removal of membrane and for other local treatment, rare though the cases be in which such procedures are attended by success. It is probable that the many secondary trachestomies which are still performed by some in Europe. when imphation is alleged to be insufficient, will not be considered requisite in the future.

In the consideration of pseudo-membranous laryngitis it should not be overlooked that in the vast majority of cases the Klebs-Löffer bacilles is found; and that all of these are, therefore, fit subjects for the use of the diphtheria antitoxin. Since its introduction both general and local (larungeal) dightheria have been greatly benefited. In its Washington meeting of May, 1807, the American Perkuttic Society received the "report of its committee on the collective investigation of the antitoxin treatment of laryngeal diphtheria in privatu practice." Its salient points are as follows. The number of cases reported during the eleven months ending April 1, 1897, was 1704, mortality 21.12 per cent. The cases occurred in the practice of any physicians in the United States and Canada. Operations employed: intubation in 647 cases, mortality 26 per cent; tracheofemy in 20 cases, mortality 45 per cent ; intubation and trachestomy in 11 cases, mortality 63.63 per cent. Number of States represented 22, besides the District of Columbia and Canada. Non-operative cases 1036, mortality 17.18 per cent.; operated cases 668, mortality 27.11

per cent. Two facts may be recalled in connection with these statements. First, that before the use of antitoxin 90 per cent. of laryngeal diphtheria required operation; under the autocoin, however, 93-21 per cent. Second, that the percentage figures have been reversed; formerly 27 per cent. represented the recoveries, now, under antitoxin, the mortality. The committee expects still better results when antitoxin is administered earlier and in larger doses, and recounceds that all cases of laryngeal diphtheria, the patient being two years or over, should receive as follows: two thousand units at the earliest possible moment, two thousand units after twelve or eighteen hours unless there be an improvement, and the same dose twenty-four hours after the second dose if there be still no improvement. Patients under two years should receive one thousand or fifteen hundred units.

Dr. Dillon Brown's personal experience being unusually large and carefully recorded, I add without comment the following figures reported by him. He divided his cases into three classes: previous to November, 1890: from November, 1890, to September, 1894 (calonel sublimation period); from September, 1894, to April 1, 1897 (antitoxin period). Of 442 cases of intubation without calonel sublimations and without antitoxin, 27.3 per cent. recovered; of 295 cases of intubation with calonel sublimations, 41.6 per cent.; of 69 cases of intubation with antitoxin, 67.8 per cent. recovered. Without sublimations, 10.1 per cent.; with sublimations, 13.2 per cent.; with antitoxin, 23.3 per cent. recovered. During the first year with antitoxin there were recoveries after operation in 38.4; during the second year, 62.9; during the third, 94.7 per cent. The apparently had results during the first year were probably due to two causes: inferior antitoxic serums and insufficient doses.

The doses have been considerably increased of late. There can be no conscientious objection so long as mishaps after the use of antitoxin do not result. Altogether, the American results are confirmed in Europe, where O'Dwyer's intubation has conquered the field. Von Bokay, Widerhofer, von Ranke, Ganghofner, Heubner, Baginsky, lately Trumpp and Siegert; in fact, everybody favors the combination of antitoxin and intehation in pseudo-membranous laryugitis.

Steamis of the larges and tracken, after observation and cicatrization by diphtheria, by spontaneous gangrene, or by pressure caused by trackeotomy or intubation tube, may cause great difficulty. Among the recommendations given for such occurrences are: intubation with or without the division of the stenosis; excision of the obliterated and contracted part, and suture; plastic operation with the aid of a skin-periosteum-bone-flap or a skin-cartilage-flap taken from the thyroid cartilage; excision of the cicatrix and transplantation (Thiersch) of a skin-flap to cover the artificial defect of the mucous membrane.

Newronic affections of the larvax of infants (and older children) are quite frequent, particularly apains of the glottis, under the influence of the inferior larvageal nerve, which controls both the contractors and the dilators of the glottis. The treatment is directed by its manifold causes. Indigestion both chronic and acute, is a frequent cause and should be relieved; particularly in neuropathic families the diet and hygiene of the infant are of the atmost importance. Fresh air, cautious exposure to cool or cold water, and early addition of liquid animal food to mother's milk or to the artificial feeding are of importance. Rhachitis, being the most frequent cause of laryngismusstridulus (p. 132), requires early attention; digestive disorders must be corrected, and the general irritability relieved by bromides or camplor. Monobromited campbor may be given for weeks in daily doses of from one to three grains (0.05 to 0.2). Emotional disturbances, which will affect neurotic children at an early age, should be avoided. A screaming spell and fright will act as proximate causes. The attacks (some beginning with appear, mainly those of laryngismusstridulus) must be watched, the haby taken up so as to case the tarynx, the head raised, the tougue (if aspirated and doubled up) drawn forward, the throat tickled, water dashed into the face, and chloroform inhaled if the local spasm be followed by a general convulsion. The influence of the thornes gland was discussed on page 146. Spasm of the glottis is, or may be, one of the constituent symptoms of stammering (p. 408).

Paralysis of the glottis is not so frequent: in the infant quite rare, and very rarely congenital. Dipheheria, hysteria, and cerebral diseases, also whooping-cough, which should be relieved as much as possible, may give rise to unilateral or bilateral paralysis, anemia may create a predisposition, glandular swellings prove a proximate cause. Hysterical paralysis with aphenia appears quite suddenly, sometimes as the only symptom of hysteria, sometimes in combination with others. One of them is anaesthesia and absence of reflex of the faures. Complete paralysis depending on that of both posterior muscles, which contract the glottis, produces a very severe dyspoora, which is relieved during expiration but cannot be tolerated long. Intubation or trachectomy may be demanded for immediate aid. Otherwise, attention to the predisposing causes, reduction of

removal of glands, and mainly the systematic application of the interrupted current through the breadth of the laryux will offer relief and gradual, sometimes rapid, recovery.

Neopleants of the infant's or child's largux are by no means rare. Many of them are congenital; mostly so the numerous pubillowers. Fibromote and enchondremets are also met with, and epithelioma has been observed. Sometimes they develop their first symptoms after an incidental inflammatory affection, or after an acute exanthema. Larvingoscopy is very difficult in the young. It can rarely be done without general anasthesia and drawing the tongue out. I saw pulse and respiration stopped and tracheotomy necessitated to save the child's life. (Alcohol applications have been recommended for their removal.) The rules for their removal are about the same as inthe adult, only the latter are more amenable to operations through the mouth. Indeed, none but older children can be thus treated. A. Rosenberg collected two hundred and thirty-one cases of laryngest supillormata in children (Arch. Largugol., vol. v.). Largugotomy gave thirty-seven per cent, recoveries. In 18.5 per cent, there occurred relapses. In the practice of a single surgeon there were seventeen operations for rapid recurrences within three years. Mere tracheotomy was performed in thirty-four-cases; four recovered spontaneously afterwards. That is the plan followed by G. Hunter Mackenzie (Br. Med. Jour., May 20, 1800), who asserts that when tracheotomy alone is performed, papillomata will disappear within a few months or a year. Of Rosenberg's cases, endolaryngeal treatment after tracheotomy resulted in a permanent cure in twelve, temporary improvement in one, and relapses in three cases. Exclusive endolaryngeal treatment gave a complete cure in fifty per cent, of children under four years, seventy per cent, between four and eight, and fifty per cent, of eight years and older. According to these figures, endolaryageal treatment is preferable unless there be a dangerous degree of dysprious, which can be treated by intubation; tracheotomy with subsequent endolaryngeal treatment will be the next choice, and laryngotomy will be reserved for very serious and unusually urgent cases. Still, it appears that the latter will be preferred by all who do not claim great specialistic skill and have no hospital at their disposal. Laryngotomy is performed after (or without) tracheotomy, according to surgical rules, exactly as for the extraction of foreign bodies. There is one danger more urgent in infants and older children than in adults,-that is, hemorrhage, slight or copious. Blood flowing down into the narrow air-passages, even in small quantities, is liable to result in Johnlar poeumonias of a dangerous character. The operation should, therefore, not

be performed without a thermo-camery or electro-cautery ready for immediate use. Foreign bodies in the larynx, more frequent in the young, though with less mortality than in the old, but more fatal than even those in the trachen and brunchi, should be removed through the mouth, if possible; if not, by laryngotomy. Laryngoscopy should precede it, when possible. In order to facilitate the exit of a foreign body from the trachen or the bronchi, trachectomy is demanded, after which it is best not to introduce a tube, except temporarily. The trachen may then be sewed to the integements, or may be kept open by hooks joined by an elastic band, according to A. Caille.

Congenital stricture of either the larynx or the truckes (rare, fortunately) may be mistaken for laryngeal tumor.

3. The Bronchi.

Broschiel catarrh (broschitis), in all its localizations, from the windpipes of large size down to the capillaries, requires an equable temperature of about 70° F., moist air, and rest in bed, though there may be no fever except a slight one towards evening. Plenty of water,-no ice,-preferably alkaline mineral waters, should be given; older children may be prevailed upon to take gum-arabic water, flaxseed tea, or other glutinous detections which relieve the accompanying pharyogeal irritation. Minigated mustard-plasters (minetard 1, flour 4 or 8) or embrocations of turpentine are used to advantage. Underelothing must be changed when moist with perspiration A cotton-batting wrapper round the class (the sheet spread out and two arm-holes cut into it) acts favorably both by keeping up a uniform temperature and by gently irritating the surface. As a rule, it acts better than warm poultices, which are liable to moisten the clothing and bedding, and thus add discomfort and the danger of a new attack. Where, however, the surface is dry, they may be applied, or, better still in most cases, a sheet of one or two thicknesses well wrang out of cool water, wrapped round the chest and changed every hour or half-hour after it has got hot. Sodium bicarbonate from ten to fifty grains (0.6 to 3.0) daily, according to age, and an equivalent of a grain of specae distributed over the day, or (and) from ten to twenty grains (0.6 to 1.5) of ammonium chloride with conal parts of extract of licorice shilly, divided into many dones during a day when expectoration is viscid and requires liquefying, will answer in most cases. Apomorphiae one-one-hundred-and-twentieth grain (0,000s) every two or three hours will art as an expecscent, so will terpin hydrate in frequent doses of from one-quarter to one-half grain (0.015 to 0.05), particularly in chronic catarriComplication with asthma and insufficient expectoration is benefited by potassium todide in daily doses of four or fifteen grains (0.25 or t.o), refracted. Insufficient expectoration with general debility demands ammonium carbonate (gr. $\frac{1}{2}$ to 1 = 0.015 to 0.06), in anise-seed tex or in milk, every half-hour or at longer intervals. aq. camphorae (one-half to one teaspoonful) often, or camphor (gr. h to 1 = 0.01 to 0.06) every half-hour to every two hours in diluted mucilage. The German preparation of liquor ammon, anisatus has been introduced into the Formulary of the American Pharmacentical Association; from two to six drops may be taken every hour or two hours. Accumulation of mucus in the broughial tubes, with inability to expectorate and danger of suffocation, may demand an emetic, and asphyxia cold affusion and raising the infant and carrying him about: frequent change of position is advisable in every severe case. When, in bad cases of capillary bronchitis, cyanosis is on the increase, and the voice has not been heard for some time, it is absolutely necessary to make the baby ery. Slapping with a wet handkerchief, swinging, or closing the pares for a few moments, and all the means recommended for the asphyxia of the newly-born, are demanded. The interrupted electric current may be used with the rules and restrictions recommended above (p. 84). Cough, when irritating and harassing, requires narcotics. Small doses of an opinte at regular intervals, or (and) a larger one at bedtime, or repeated doses of extr. hyoseyami (grs. t to 13/2 = 0.06 to 0.1 altogether through the day), and an opiate for the night, act very beneficially.

The chronic form of broughial catarrh demands similar medication. Preventive measures are the habitual use of cool or cold water and the treatment of such constitutional disorders-for instance, rhachitis-as are known to create a predisposition. Plenty of water, or alkaline water, will dilute expectoration. When this is very copions and difficult, and the cough most annoying in the morning, the patient should be kept lying down for several hours, with the trunk raised. Terpin hydrate and terebene, ten or twenty drops daily, will act well. Ammonium chloride may be evaporated on a hot stove or tin, enough to penetrate the whole room (no tent required), and inhaled. Turpentine inhaled with steam or spread on spenges or towels is also useful. The pneumatic treatment (inhalation of compressed air) has been recommended again by Biedert and Quimby; it finds its principal indications in atelectasis and peribroughitis. The frequent complication with pharyogeal catarrh derunds the local treatment of the fances; a mild solution of silver nitrate (1 to 500) may be used as a spray once every day or every

two days. When tuberculization is feared, the protracted use of cod-liver oil, guaiscol several times daily in two- or four-frop doses, or creosots, or their carbonates, which are taken so much more readily, together with a change of climate, preferably moderate altitudes, are indicated.

Fibringur broughills is by no means so rare as it was formerly reputed to be. Indeed, during epidemics of diphtheria it is not uncommon. Still, the psendo-membranes found in the brouchi are not always of the same nature. While some are diphtheritic, others consist of dry and coagulated mucus resembling the membranes of "enterthis membranosa." In accordance with this difference of the prevailing condition, a case may last days or months. Antipyretics are still less indicated than in the common forms of broughitis. Mercurtal treatment like that required in diphtheritic laryngitis of every variety (p. 417) is the most reliable internal remedy. Inhalations of steam, frequently repeated or kept up constantly in urgent cases, inhalations of terpentine with or without steam, of ammonium chloride, often repeated, and fumigations through one or two days of from five to fifteen grains (0.3 to 1.0) of calomel (when dyspines is argent, every hour or every few hours, under a tent) will act well. The internal use of potassium todide in daily doses of from ten to lifty (0.6 to 3.0) grains, and, in cases of undoubted bacillary dipletheria (p. 243), antitoxin are indicated and useful.

Bronchial catarrh, crosp, and some forms of pneumonia are proximate causes of a collapse of pulmonary tissue (atelectoris), the congenital and postnatal varieties of which have been treated of before (p. 86). The predisposing causes are general atrophy with its mincular debility, and rhuchitis through its narrowing the thorax. In this condition, replete as it is with imminent danger, the haby must be carried about, the posture in bed must be charged frequently, he must be made to cry, electricity should be used, and, besides an occasional emetic, stimulants, such as alcohol, campbor, ammonium carbonate, and musk, should be employed frequently and conjoursly.

Bronchiceturis may have one of neveral causes. The bronchial wall may be feebly developed at birth; it may become weakened by the degenerative processes of an acute or chronic bronchitis; or it is acquired by the traction of cicatrizing pulmonary tissue, resulting from the effects of a protracted interstitial periheoschitis ("pneumonia"). Arsenic and phosphorus treatment is indicated when the former conditions, iodides when the latter can be diagnosticated.

The mature and symptoms of authors do not differ from those

of the same affection in adults; nor does the treatment. It is a spasm of the circular muscle of the bronchi (not the diaphragm). When a catarrh (broughitis) precedes or follows it, the feebler longitudinal fibres of the muscular layer lose in strength compared with the circular, and prolong the attack. During the attack proper there is very little expectoration, the bronchioles being filled with lymph exidate and large cells and the Leyden crystals. Its neurotic character is silustrated by those cases which are accompanied by urticarsa (internal urticaria? A. Packard). Swelling of the mediastinal glands, adenoids, hypertrophy of the tonsils, flatulency which impedes the free movements of the diaphragm ("asthma dyspepticum"), peribeonchitis, emphysema, which is by no means rare, and rasal reflexes are the main causes, and should be attended to. In the latter class of cases brushing the mucous membranes of the 2050 and pharvnx with a cocaine solution of from two to ten per cent, or the use of cocaine spray, may, in appropriate cases, relieve an attack: the canterization (actual or chronic acid) of the hypertrophied tissue and the removal of a polypus may occasionally be the only things required for an actual cure. Unfortunately, this class of cases is not so numerous as it was believed to be a number of years ago. Those depending on peribronchitis and emphysema are more frequent. In them the protracted use of three daily doses of from two to five grains (0.125 to 0.3) of potassium iodide, together with a sufficient bedtime dose of chloral or of an opiate to meet the right attack, will have favorable results. Tincture of lobelia, two or three drachms (eight or twelve cubic centimetres), fluid extract of quebracho or of grindella, one or two drachms i four or eight cubic. centimetres) daily, will often have a beneficial effect in distressing dyspoga. The inhalation of stramonium, of potassium nitrate paper, or of pyridin vapors is often resorted to; unfortunately, with so little permanent result as to give any number of proprietary medicines and nostrums a large field of activity. The treatment of enlargement of mediastinal glands, of tonsils, and of flatulency has been discussed in other chapters.

The periodic night-cough, described as a special variety in some of the books, is either a mild attack of authma or is plaryngeal or inherentar; most pharyngeal coughs, however, are met with in the morning, after unhing up. These nocturnal attacks may be obvized by a drink of alkaline water at bedtime, to be repeated at every waking up, by a dose of a bromide, or of chloral, or of an opiate at bedtime, and by attention to indigestion and constipation. Quinine is useless. A reflex cough may depend on changes or a foreign body in the external ear, the septum or the conclus of the nose, or on a neurosis of the storeach. A careful examination with otherwise negative results will direct attention to these localities and indicate the treatment.

4. The Lauge.

Presentation - There are three anatomical varieties of pneumonia in infancy and childhood; the catarrhal or lobular, the fibrinum or lobar, and the interstitial. Nearly two-thirds of the cases belong to the first, one-third to the second, and a limited number to the third class. Not one of them, however, is always found pure and uncomplicated. Indeed, complications of the lobular with the lobar, of either of them with the interstitial, and possibly of each of the three with pleurisy are quite numerous. The lobular form is almost always, the lobar quite frequently, preceded by brouchial catarrii, which has its well-understood sources in previous attacks, in exposure, sudden changes of temperature, local irritation by foreign bodies, chachitical or tubercular mediastinal and broochial glands, diphtheria, measles, influenza, typhoid fever, whooping-cough, etc. Thus, the preventive treatment of pneumonia has its positive and distinct indications. Nasal catarrh is never so slight as not, possibly, to endanger the lungs. Rhachitis, glandular tuberculosis, measles, and whooping-cough must not be let alone to find their slow road to their legitimate termination for better or for worse. Every child, while well, should be armed against the results of exposure by regular invigorating abbitions and frictions with cold water, and when exposure has taken place and the consequent fever made its appearance, a warm bath, ammonium acetatr, camphorated tincture of opium, tincture of aconite, hot drinks, sodium saliculate, or another one of the antipyretics and diaphoretics, with uniform temperature and rest in bed, may be the means of preventing percomonia.

The treatment of pneumonia is not yet much influenced by modern riews on etiology. The attempts at procuring immunity is animals by the blood-serum of pneumonic patients, thus establishing a serum-therapy, may prove more successful when more is known. The large number of microbes which are found in pneumonia—pneumo-occus, diplococcus lanceolatus, streptococcus, staphylococcus, and others, which are found as well in other parts of the body and in other processes—do not yet justify the removal of pneumonia from among pulmonary discusses and its exclusive classification among infections fevers. The assertion that it is only a process of germ-culture in which the air-cells act as culture-tubes and the exudation as a culture-medium, while the nutrient circulation maintains the integrity

of structure without taking an essential part in the pastmonic process, has been ably defended by A. H. Smith, who explains the preumonic crisis by the death of the preumococcus and the formation of an antitoxin when the culture-medium is exhausted, and finally by the fatal influence on the pneumococcus due to pneumic acid (which normally binds carbonic acid in the lungs), which meets no longer with carbonic acid.

Both the infectsous and the contagious character of pneumoniawere observed by Sir Hermann Weber in 1869. He describes (Festschrift, 1900) cases of a "pneumonic fever as an infectious fever, the prominent symptom of which is a lobar pneumonia." His cases ran, after an incubation of from eleven to thirteen days, an acute course of four to six days, were located in the lower lobe, very contagious, and exhibited a rapid decline. One developed afterwards great weakness of the heart, one neuritis, and one a peculiar delirium such as he has frequently met with in the rapid decline of febrile diseases.

On the other hand, lungs of children who did not die of pneuminia, also those of recently killed domestic animals (Durck in Drutsche Arch, blin. Med., 1897, vol. lviii.), contained the diplococcus pneumonia and the mixture of bacteria met with in pneumonia. Pure cultures of bacteria blown into healthy lungs gave Dürck no pneumonia, irritant dust did; so did cultures and dust mixed. Here, as almost everywhere in bacteric utiology, it is not the presence of everso many highly virulent microbes, but their fixation and their ability to generate toxins, which sleseres credit for morbid tissue changes.

Acute lobular presumonia is less a systemic discuse than is the lobar form; its direct and immediate influence on the nervous and muscular, inclusive of the cardiac, systems is less marked; it is not so frequently complicated with pieurisy. Thus, there is less danger at first in lobular pneumonia; there is more at a later period, because its duration is liable to be so long as to make the prognosis uncertain. The danger may come from the heart, but it mainly lies in suffocation, which depends less on the extent of inflammatory exudation than on collateral congration and ordense.

Interstitial pneumonia runs the most protracted course. Fever is liable to be high and prolonged over weeks and menths; recovery is rarely complete, induration and retraction of the pulmonary tissue, with bronchlectasis, being quite common. Bronchitis is often early and extensive, mainly when there is pleuritis also, and liable to become chronic.

Thus, it becomes evident that no uniform course of treatment can be dictated either for all forms of promuonia or for all cases. The former are several, the latter are individual. After all, the patient is to be treated, and not the Greek name of his disease. Still, there are certain rules which ought to be enforced in every case.

Insist upon absolute rest of body and mind, exclude visitors, light, and noise.

Keep the temperature of the room between 68° and 72° F. and the air moderately moist.

Lat the patient select his own position-

Isolate a Johan case,

Give liquid food and plenty of water, or lemenade, or hydrochloric acid and water.

Relieve the circulation from accessory incumbrances; a dose of calonel will facilitate the action of the disphragm by emptying the bowels and relieving flatulency, and will diminish the tension of the arteries.

The main dangers in acute pneumonia are: high temperature, beart-failure, and suffocation, which may result from the condition either of the lungs, or of the right heart (the left not being at fault so often as it is in the adult), or of both; also complications like that with nephritis, which is either a coincident or the result of toxic (pneumococcic?) infection.

Which degrees of temperature may be allowed to last and which are to be interfered with? Is it 103°, 104°, or 105° F.° It is well understood that persistent high temperatures disintegrate tissue, but this effect is not equally observed in all cases. Many a child bears 104° quite easily, while others successed to 103°. Moreover, a temperature which is bally berne the first day on two appears to be an indifferent matter afterwards. Thus, an antipyretic treatment may be indicated at first and be no longer required later, particularly in those cases which exhibit a decided morning remission; for ± is mainly a persistent height of temperature that is injurious, not its recussional, though regular, rise. That is why, for instance, relapsing fever, with its enormous temperatures but complete and long intermissions, has only a small mortality.

The custom of depressing temperatures in all cases which exhibit 103° F., or thereabouts, is bad; it is not the temperature that is, by itself, injurious, but the absence or insufficiency of resistance that the tissues offer to its action. To lower temperature we have a number of remedies. The latest additions to our antipyretic treasures are very well known and too universally employed. Phenacetin, antipyrin, etc., have more frequently lowered temperatures than they have saved lives. Their doors, uses, and dangers are well understood by all prac-

thioners. Whenever they are found incompetent, their combination with quinine has proved more effective. The latter, by itself, is, however, no longer the nine que non which it was formerly believed to be. In all cases with marked remission it acts well, but it should be given only during the remission. From half a gramme to a gramme (eight to fifteen grains) may be thus employed. It may be used internally or hypodermically. Now and then injections into the rectum, or suppositories, are required or advisable when the stomach cannot be relied upon. The preparation to be used in the rectum must be one of those which are most soluble: the bisulphate, muriate, bromide, or carbamide. No acid should enter into the solution; large quantities of glycerin are objectionable. The rectal dose should be at least fifty per cent. larger than that employed internally (p. 67).

The lest antipyretic is cold (p. 57). Its use has been praised and condemned, as everything deserves to be that is employed either properly or thoughtlessly. Most cases will do quite well with sponging, or with friction by means of wet and cold towels The latter plan acts both as a refrigerant and a stimulant. Cold. bothing was once cologized immensely, then rejected and warm bathing substituted. The rationale of cold bathing is the cooling of the surface (that is, of fourteen square feet or more in the adult : more than proportionately that in the young) with its immense ourface circulation. So long as this circulation continues active, new blood will come to the surface every moment, and the whole body is thereby cooled. When it is no longer active, the heart weak, and the extremities cold, cold bothing is dangerous. The rule I have always followed is this: no cold hath for cold extremities; no more cold hathing when once, after it, the extremities remain cold or cool. In these cases after a cold both the surface becomes colder than before, it is true; the interior, however, warmer than it was. I reported the case of a little child, thirty years ago, that was the first to teach me that lesson. A few cold boths had reduced his temperature and his tendency to consulsions. Then another seemed to be indicated. It appeared to render the required service, but the haby became convulsed. The temperature in the rectum had risen from 1043/2" to 106" F. A hot bath, instantly given, restored the external circulation, and ten minutes afterwards the rectal temperature was below tou"-

A great promoter of circulation, and thereby of radiation from the skin, is surface warmth, and particularly warm extremities. Warming-pans ought always to be applied to the feet and legs when cold is to be employed on the rest of the body. In place of cold bathing. I have mostly employed cold packing from the chest down to the thighs, the arms usually outside the pack. Nothing it easier than to wrap a buby up in a single wet towel, which is covered by a small blanket; in an argent case it should be replaced by another one (spread out beforehand) every two or five minutes. From twenty to forty minutes' packing will reduce the temperature from 106° to 101° F. and below. In many instances the rapidly falling temperature demands artificial warming immediately afterwards. When the frequent changing of the pack is undesirable, the cloth may be allowed to remain, and is frequently cooled by rubbing a piece of ice over the whole surface. If water collect under the patient, it can easily be absorbed by towels or sponges. A temperature of 1083 in a haby of four months, suffering from pneumonia, was reduced to tout" in twenty-five minutes; after that it sank rapidly to 0456° F., and artificial warming of the surface was required.

From what has been said it is evident that very feeble and anxinic babies do not tolerate cold, though their temperatures be ever so high; in such cases a warm both, or topid packs either with water or alcohol and water, or a warm bath gradually and gently cooled down while the little body is constantly being rubbed, should take the place of the cold pack; or cold applications to a part, perhaps the anterior aspect of the chest, are found to suffice. They both reduce temperature and relieve local pain. In many cases a light ice-bag over the beart acts both as a refrigerant and a stimulus to the organ at the same time.

The acceptance of these views I argently recommend to those to whom they are in part new. Before and after 1870, when I recommended (New York Medical Record) cold water in typhoid fever, scarlatina, variola, ophthalmia, tiphtheritic conjunctivitis, diphtheria, lobar and other pseumonia, heart disease, local inflammations, phlermon, synovitis, and peritonitis, I had ample opportunities to test what I am here advocating. Those who want to inform themselves thinoughly on matters connected with this subject I refer to Dr. Simon Barneh's well-known book, and other writings.

The heart furnishes argent indications for treatment in many cases of preumonia. When in a healthy condition, its innervation and force are not easily disturbed; still, every pulmonary disease taxes its powers. Lobar preumonia requires cardiac stimulation at an earlier period than the lobular kind. There is none, however, that does not demand it at some time or other. That being the case I carnestly advise not to usait, for heart-failure is more easily pre-

vented than cured. He our treatment ever so expectant, it must not be indolent and indifferent. In order to correct the faulty pulmonary circulation the heart should be stimulated at an early period; but how?

Alcoholic beverages are employed for this purpose by many, for alcohol is certainly a cardiac stimulant; it is believed by most to lower arterial tension,-a function which is doubtful, at least in pure "inflammatory" disorders; in most infections fevers arterial tension is reduced by toxins which cause a vasomotor peripheral paralysis. That would militate against the use both of alcohol and of nitrites in the early part of an infectious disease. Moreover, alcohol is believed to be an article of food. In the small quantities in which it is administered it certainly is not. Four per cent, of it is eliminated unaltered through the lungs, which are thus burdened with that additional labor while in a condition of congestion and incompetency. Besides, kidney complications, which are not rare in pneumonia, and brain affections, which are frequent, particularly in small children, contraindicate the use of alcohol. I dare say that the pneumonia of a fairly developed infant or child contraindicates rather than demands the administration of alcohol at an early period of the disease, Later, when the conditions change, alcohol may be required in large doses, always, however, much diluted.

Digitalis stimulates and contracts the heart, but also the arteries. both the largest and the very smallest, and thereby increases the petipheral resistance (more in the old than in the young). A few large doses may restore the equilibrium of the faltering circulation, and should then be stopped. I have not infrequently given the equivalent of from one to four grains of digitalis (0.00 to 0.25) in a single dose, which was repeated one or more times. This mode of administration insures all the coveted effect on the heart and pulse without any irregularity, and gives both a result in a few hours and the indication to cease, while the usual small doses exhibit their action after days only. We may afterwards continue its use in small doses, either alone or in combination with stroplanthus, sporteine, or exfiring, all of which have no such disagreeable effect on arterial tension as digitalis; or we may give them without digitalis. To give doses of tineture of streekanthus of less than a drop, or sparteine sulphate of less than one-quarter or one-righth of a grain, every hour or two. is useless. Such effect as we require we have a right to demand steedily, and the doses should be large enough to enforce it. During the last year I made systematic bedside experiments with digitalis in acute precumonias of babies from four months to two years of age. I take it for granted that the patient should be spared useless doses. If a rapid effect is to be obtained, the dose should be just short of the over-effect, the symptoms of which can be judged nowhere better than when giving digitalis. A reliable incrure was given in doses of from one to four drops every hour or every two or three hours, with an effect that became marked enough in one or two days, and mild enough to allow ample time for a modification of the dose. Let it be plainly understood that digitalis is a useless drug when given in the small doses recommended by the books.

Whenever the peripheral circulation becomes insufficient, with small pulse, digitalis alone must not be continued; it should be combined with nitroglycerin or sodium nitrite, the former in hourly or hibourly doses of from one-five-hundredth to our-one-hundredth of a grain, the latter in doses of from one-tenth to one-quarter, or these remedies may be given alone until the pulse is revived, but no longer. They are principally required when the feebleness of the heart is mainly perceptible in the right centricle. There are cases of pneumonia in which the arterial pulse is good, but the external veins large, the nails blue, the skin cyanotic, with great dysproca and pulmonary ordena, together with perspiration, increased cardiac deluces, enlarged liver, intestinal oversecretion, and albuminuria,-symptoms which point directly to incompetency of the right ventricle. In these cases the external circulation must be restored at once, and the retrites will contribute to fulfilling that indication. So will distretin in doses of from two to ten grains (0.125 to 0.6) administered from three to five times a day. Besides, local depletion by leeching will sometimes do good. In the adult we should open a vein; a child of advanced age may also be saved in this way. It is in those cases also that the inhalation of oxygen (better through the nose than the mouth, best through a paper bag) and artificial respiration will contribute a great deal towards saving time and life.

The distressing cases of catarrhal pacumonia engrafted upon the extensive bronchial catarrh or capillary bronchitis of the very young will sometimes get well only after we have succeeded in making them cry, together with artificial respiration, inviting the respiratory muscles to reflex efforts by dashing cold water on them, using for brief moments the interrupted current, etc.

Direct stimulation of the heart may require the use of strychnine in small and frequent doses (a haby of one year not often more than a thirtieth of a grain = two milligrammes during twenty-four hours), and ammenium carbonate one-half of a grain or a grain (0.03 or 0.06) in anise-seed water or in milk every half, one, or two hours. In cases of orgent necessity the stimulants should be used subcutameously, the strychnine sulphate in repeated doses of one-one-hendredth grain at least, the sodio-salicylate (or benzoate) and sodio-caffeine in doses of from one to five grains (equivalent to one-half of that amount of caffeine) every one or four hours; campbor will serve the same purpose. Its solutions in alcohol or other are quite painful. I always employ it in four or five parts of sweet almost oil; of this I inject from six to twenty drops, according to indications; very slowly, because it passes through a fine needle with more difficulty than does a watery solution.

In connection with these remarks we are enabled to judge of the claims of the routine treatment with strychnine, sigitalin, and aconitine which was imported a few years ago. It is easily perceived that it finds its indications like a ready-made coat which fits many, but not all, and would not be worn unless first tried on. But a coat is not so easily believed to fit everybody as is a newly eulogized treatment.

During the last few years creosote carbonate ("creosotal") has been recommended in preumonia as almost a specific. More than a dozen cases were treated in a hospital ward. The patients were infants from one-half to two years old, and the daily doses amounted to twenty or thirty grains (1.5 or 2.0). I cannot say that the cases ran a more favorable course than under other treatment; in some I was compelled to resort to active carefice stimulation.

When, during hepatization and the period of incipient resolution, expectoration is insufficient, the remedy is inhalation of steam, with or without turpentine. The latter may be spread through the room by means of large sponges, or on toucls which are soaked with it, or it may be evaporated on boiling water. The easiest way is to fill the whole room with the vapor. Inhalers are insufficient and annoying. Give camphor, aqua camphora in teaspoonful doses or more, or one-quarter- to one-grain doses in diluted mucilage, or benzoic acid powders in the same doses, or ammonium carbonate. Inecae may derange the stomach, senega is either an adjuvant or a placebo. Drinking of plenty of water, mainly alkaline waters,-Seitzer, Vichy, Poland,-also doses of sodium bicarborate or potassimm iodide, will increase and liquely the bronchial secretion. Ammonium chloride is of but little use in hepatization; but evaporated in amounts of ten or twenty grains every few hours on a hot stove or over a flame, it fills the room with a white cloud which greatly stimulates the brouchi. Warm poultices will serve the same purpose. Their place is during hepatization for the purpose of aiding absorption, not in the first stage of pseumonia. When nursing is insufficient, and there is danger of wetting the clothing and bedding, it is best to substitute for them a conton-wadding jacket, covered or not with oil silk or, better, flannel, which protocts against exposure and loops up a uniform temperature of the skin. When bepatization is completed and absorption is slow, the indication is to give iodides a long time.

Pleural pain is relieved by gently strapping the chest, when tolerated,—it mostly is,—by simpisms, which must be kept on a few minutes only and repeated from time to time; warm positices; a few does of sodium salicylate or phemocetin; in urgent cases by a subcutaneous injection of morphine. Vestcatories are injurious; they chafe, irritate, and annoy. Their only—rare—indication is in the long persistence of tepatiration, with or without chronic pleurisy.

Irritating, backing cough demands small doses of opium. Much of this cough is pharyngeal, and is relieved by frequent drinking of small quantities of water. Sleeplesoness and great general irritation require a dose of opium for the night. A sleep of an hour or two affords great relief to the cough and to all the symptoms. As a general rule, however, the habit of giving opium in the first stage of pasamonia is a bad one. Rest should not be bought with death.

The bad odor of complicating gangrene indicates inhalations of turpentine, encal-ptol, or carbolic acid; the persence of abscesses in the Imag demands surgical interference, unless there be a spentaneous rupture through a bronchus. Most abscesses are within reach of the knife and actual cuntery, for generally there is a sufficient amount of pleural adhesion to render access devoid of much danger.

The prognosis of operations on pulmonary abscesses depends on their age and nature. Acute abscesses give a better prognosis than chronic, simple abscesses (though complicated with bronchiectasis) a better one than those which are putrid. Those depending on foreign bodies are not favorable, those originating in tuberculosis still less so. The latter are frequently multiple. Operation on the lung should be preceded by the resection of a rib. It is facilitated by pleural adhesion, but rendered difficult by the uncertainty of localization through percussion and asscultation. Deep-scated abscesses should be reached with the actual cautery, to senid hemorrhage. On a colored girl of four years, however, I operated for deep-scated gategrene of the lung with the knife, being sure beforehand that the lung between the abscess and the chest-wall was carnified, though the expectoration was very bloody.

Complication with malaria, which is mostly rare, but was quite

Irequent in New York in 1898 and 1899, requires quinine, best during a remission: intermittent preumonia, which is also uncommon, quinine and ergot; complication with nephritis contraindicates digitalis and alcohol, and suggests the substitution therefor of sparteine, camphor, and nitroglycerin; in ateleetasis the stronger stimulants are required, and artificial respiration by the different methods; the patient should be made to cry; cerebral disease, when acute, indicates ice and purgatives and beomides; when chronic, potassium iodide.

Hypostasis and hypostatic paramosia, so common in infectious diseases and in conditions of great debility, require frequent changing of position from one side to the other and the early administration of stimulants in large doses, together with friction of the entire surface with cold or hot water or with alcohol and water. The most powerful of all internal stimulants—minsk—should be given frequently,—viz., every half to one or two hours,—in doses of from one-half to two grains, until from six to fifteen grains (0.4 to 1.0) have been taken in the course of half a day.

Interstitial pacamonia is treated on the general principles laid down above. Later, potassium isolide in sufficient doses, a mild tincture of isoline externally, and an occasional vesicatory. When it has become chronic, digitalis may be given for months in small doses to keep up both a sufficient circulation through the indurated lung and a competent nutrition of the heart muscle, and potassium isolide alternating with isolide of iron. Persistent and careful palmonary gymnastics should be continued for years.

Non-intercular palmonary phalmin should not be considered a nesological entity; it is the result of a variety of causes, such as primary bronchiectasis, or fibrous, syphilitic, or actinomycotic degeneration (p. 439). The fibrous degeneration is mostly due to protracted or repeated pneumonias terminating in carnification, multiple cicatrices (which may surround either healthy or atelectatic pulmonary tissue), and in many cases of pigmentation. Bronchial and pulmonary alterations are met with after both fibrinous influents and pneumonia. Hansemann states that one of the principal causes is chronic lymphangitis.

Emphysicus of the infant lungs, sometimes not easily diagnosticated became of the size of the liver and of abdominal tympanites, and never unless percussion be performed very, very gently, is often overcome by the elasticity of the pulmonary tissue, and therefore its prognosis, no matter whether produced by forced inspiration (in pneumonia) or by forced expiration (severe attacks of coughing), or even that rare form which results from ill nutrition of the alveoliis not so had as it mostly is in adults. Its treatment is that of cheenic catarrh, and by gynnastic exercise of the respiratory muscles and general roboration. Besides, forcible expiration ought to be practised extensively: during expunition the chest-wall ought to be well compressed. Small should be used half a dozen times daily, and copious successing procured. Expiration into the rarefied air of one of the many pneumatic apparatuses is also recommended. It may be tried on tractable children.

Pulmosury solvino requires the causal treatment of its origin, which can be traced to cardiac, pulmonary, or renal disease. Urgent cases—for the disease may prove fatal in a short time—require dry copping, now and then the emptying of the lungs by an emetic (apomorphine subcutaneously when vitality is low and the expelling non-cles are treable to act), and stimulation of the excreting organs and of the heart. A powerful purgative—calentel, croton oil, or elaterium—is an active derivant. Digitalis in large doses (a few minims of the fluid extract at once) will stimulate the heart. Sodio-caffeine salicylate or bearoute, in subcutaneous injections, from one to five grains (0.05 to 0.3), repeated five or six times at intervals of fifteen minutes, acts beautifully. Lead acetate stops oversecretion in a good many instances. Pilocarpine (from one-twentieth to one-sixth grain) subcutaneously has relieved, and saved, many a case resulting from renal disease.

Palasmary hemorrhage is not frequent, for tuberculosis of the young lung produces induration and vascular obstruction rather than cavities; and though whooping-cough gives rise to hemorrhages, they are tracheal and bronchial rather than pulmonary. Caroline diseases may lead to venous obstruction and thereby to hemorrhages. Digitalis, lead, alum, ergot, narcoties (mainly opiates in quieting doses), and ice temporarily to the chest, with a hot (mustard) both of the lower half of the body, as well as absolute physical and mental rest, are indicated. Dennelin collected twenty-two cases occurring in the newly-born (Rev. Oral Internat., January 1, 1807). They were either speedily fatal or gave rise to alleged melana (blood swallowed).

Inforction, with its sudden coset and vehement dyspecta (sometimes chill), is, in the newly-horn, the result of embolism from the ambilical vein or the ductus arteriosus; later from a marantic thrombosis of the sinus, the renal, femoral, or portal vein, or from caries of the petrous or some other bone, from valvular disease, from an infectious malady, or from an extensive burn. The causal indications must be obeyed, if possible. Ice applications to the affected part,

epiates and digitalis, and stimulants when required, symptomatic treatment afterwards (untipyretics).

Some of the cases are followed by gaugrene. This condition, however, generally results from the presence of foreign bodies, from acute infectious diseases,—diphtheria, measles, norm, typhoid,—or from (mostly lobular) precumonia, also after infarctions. A few cases are also on record as having resulted from careless precumatic treatment. Mineral acids largely diluted with water, as also quintine and lead, have been copiously used. Besides stimulants given to the required extent, I have relied mainly on inhalations of turpentine, either from a paper hag in which a sponge was kept scaked or from a kettle with boiling water, or of terebene; internally, of terebene, from twenty to fifty drops daily, or crease a few drops daily. Latent pulmonary gaugrene, not connected with a bronchus, may exhibit no odor, but great general asthenia (Martinez Vargus in Festschrift).

Such paradoplasms as have been or may be observed in the young lungs demand treatment on general principles. Carcinowa has been noticed a few times, also in the mediastimm. Surcoma is more common, mostly in the pleura. The treatment should consist in increasing doses of arsenic, and in the injection, according to Coley, of the toxin of the coccus erystpelatos and bacillus prodigiosus. Echinococcus of the lungs and pleura (fluid without albumin and sodium chloride, and with scolices) demands free incision, resection of a rib, and drainage. Puncture and the injection of Lugol's isdine solution do not suffice. I, von Bokay (Festschrift) performed Baccelli's operation between the fourth and fifth ribs in the left axilla. He removed thirty cubic centimetres of the fluid, injected twenty cubic centimetres of a one-per-mille solution of corrosive sublimate, and repeated the operation after four weeks. Recovery. Actinous rosts has been reported by Soltmann: the case occurred in the posterior mediastimms of a boy of six years; also by Karewsky. It may remain unrecognized, "latent" inside the lung, may perforate to the surface and through the chest, or may gain access to the abdomen and cause metastascs. Potassium iodide and operation.

Herniq of the lungs has been observed below the clavicle and on the back. The soft, elastic tumor changes its size with respiration. In such cases the lung is either normal or emphysematous. The cough disappears after the application of proper bandages. Deformines of the chest-wall, with or without a defect in bones (ribs or stername—figures sterni congenite—) or muscles (pectoral), particularly the funnel chest, in which the lower part of the sternum is, by an arrest of development occasioned by the pressure of the em-

bryonal head while amniotic liquor is scanty, so drawn in as almost to totich the vertebral column, can never be removed, but the consecutive contraction of the intrathoracic space can be partially counterbalanced by systematic gynmastics and functional improvement of the lungs at an early age.

5. The Introthoracic Lymph-Bodies.

In close connection with the congestive and inflammatory diseases of the thoracic organs are many changes in the brouchal and madiastisal Jyugh-bodies, which can more easily be presented than enred. A protracted catarrh of the bronch results in glandular hyperamia and hyperplasm; a masal catarrh of the newly-born and the musling descends rapidly with the same offert, or the consecutive glandular timefactions of the submental and submaxillary regions implicate the adjoining tiers of lymph-bodies; rhachitis, scrofula, and tuberembasis are also causes of bronchial and mediastinal adenitis. Bacilli may reach the lymph-bodies through the mucous membrane of the bronchi, though its spithelimm be intact. Pressure on veins and nerves, occasionally with dilatation of one or both pupils, also on the traches; attacks of coughing without crowing inspiration; fremitus, feeble or increased; respiration, increased and beorehinl or feeble; dulness over the stermin down to the second rib, but not extending to the extenor margin of the lungs; dulness posteriorly about the bilum of the lungs, more marked to the left than to the right. (location of thoracic duct on the left), are among the principal symptoms. Pressure on the traches or on one of the large brough may be such as to cause an artial stenosis and suffocation. Fever, if present, depends on complications or on absorption from the glands while undergoing changes. Abscesses may cause pyremia, or perforate oto the oscobagus, or the traches, or a lung. Antirlarditical, antiserofulous, and antitubercular treatment are the indications. Mercurial continent, potassium isolide continent, immetion of green soay, potassium iodide internally, iodide of iron, increasing does of arserie, ice externally if there he any local pain, and the treatment of sequele or complications (catarrh, lobular pneumonia, dyspnea, protracted fever) are demanded, but will not always prove successful.

b. The Pleura.

Pleasitis is of frequent occurrence during the first decade of life; empyema is, indeed, more common during infancy and childhood than in advanced age. The majority of cases of pleasitis which occur in the newly-bern are secondary, of pyemic origin, and depend

mostly on umbilical phlebitis; still, cases with serons, and the usual forms of purulent, secretion are not uncommon in the very young. Pleuritis may be the direct result of exposure ("cold"), of commsion, of broncho- and fibrinous pneumonia, of pericarditis and peritonitis, or of a neoplasm (then the effusion is mostly hemorrhagic). It frequently accompanies pulmonary tuberculosis (often "dry," rarely serous, more frequently sangumeous), diphtheria, acme thenmatism, and eruptive fevers. Thus, there is but rarely a causal indication for treatment; prevention is best secured by giving the nament care to the management of those diseases which cause its outbreak. Its symptoms are often deceptive, for even pain is not always present, though it is one of the most frequent occurrences. The pain is sometimes quite local; at other times, however, it extendsover a large surface. Its locality does not always correspond with the son of the pleuritis. For instance, the extension of the peripheric ramifications of the intercostal nerves is so great that the children often complain letterly of epigastric pain down to the umbilious on the affected side. The disease requires absolute rest and immobilization of the chest. Broad strips of the usual varieties of adhesive plaster, which irritate the surface and render local applications difficult, are inferior in value to the plasters prepared with zinc. A broad handage or a moderate-sized towel fastened round the chest with safety-pins is more appropriate and is well tolerated. An ire-bag applied to the diseased region will often render the best service; it must not, however, come in contact with the bare slon. When no bandaging is required, a cloth well wrung out of cold water, of the size of half a square foot, more or less, or surrounding the whole chest, may be applied every fifteen or thirty minutes. It should be covered with nibber cloth and flannel. In very bad cases the pain should be relieved by a subcataneous injection of morphine; its internal administration is generally useless and sometimes hurtful. Local depletion by cups or leeches I have rarely used these thirty years; dry cupping may relieve such children as are old enough and intelligent enough not to get excited and not to harm themselves by screaming and active resistance. Mustard-plasters must not remain longer than a few minutes, and may be repeated every few hours. Warm fomentations will relieve assemic and feeble children; they ought, how ever, to be avoided in the beginning of the disease, when the indication to limit congestion and secretion is paramount. A dose of calemel sufficient to relieve the bowels (sometimes followed by an opiate) and sodium salicylate in doses adapted to the age of the patient are the remedies which will bring relief. The salicylic acid

in the latter is not present in sufficient doors to lower blood-pressure to an uncomfortable degree. Vesicatories are much less indicated in the first stage of pleuritis than perhaps later; they always irritate both the skin and the patient, cause sleepless nights, and add to the discomfort of the patient, and discomfort and sleeplessness impair the prognosis. If there were a benefit to be derived from libstering, the condition of the pleura might be improved, perhaps, but the sick injured, probably.

If the temperature be so high as to injure the patient, antipyreties should be given. Probably from three to ten grains of quinns administered before mon will lower the afternoon rise. If required, a dose of phenacetin, with or without a moderate dose of coleine, may be given at eight or ten o'clock at night.

When the fever decreases, or when the heart begins to get weak previously, digitalis, strophanthus, sparteine, or caffeine, with or without ammonium carbonate or camplior, is indicated; no improvement, either through disphoresis or digresis, need be expected so long as the heart remains weak. The choice between the caffeine preparations is a matter of indifference. The salicylic acid in the double salt (Na + Caffeine) is not sufficient to depress the heart's action. At the same time an acetate, or a citrate, or an iodide may be given. Filocarpine, which has been recommended, is a two-edged sword, and requires a stronger constitution than almost any baby and most older children can boast of, in pleuritis there is no vital indication that can be fulfilled by pilocarpine to such advantage as may be derived from it in certain cases of acute pulmonary or intracratial ordens. Externally, at this period, tineture of todine diluted with alcohol may do some little good, particularly in cases of "dry plenritis." It is this form mainly which will be benefited by warm fomentations and the use of iodides. When the main indication is to absorb effusion, abstinence from drinking, and the use, in tair doses, of table salt, which increases distrests, will be found useful. Distretin, in four daily doses of from two to five grains (0.125 to 0.3) or more, may stimulate the action of the kidneys to such an extent as to result in the absorption of the pleural effusion. Milk-sugar in drachin doses, as much as an ounce daily, may be given as an adjuvant to increase dimesis.

The indications for operative interference with the picural effusions, no matter of what description, are various. It is demanded when the difficulties of either respiration or circulation, or both, require immediate relief. The latter may suffer even without the participation to a great extent of the former. Indeed, Trousseau describes a case of fatal collapse due to nothing but disordered circulation. Among the symptoms urging the operation are intense drapaga, cyanosis, diminution of the renal secretion, amsurea and ascites, and a considerable dislocation of the heart or the liver. In many cases the intercostal interstices are no longer visible, either on inspiration or expiration; they are even found bulging. Not in every case are the consecutive disorders proportionate to the amount of effusion; indeed, this may be small compared with its effects when the pleanitis is complicated or secondary to a disease of either beart or kidneys, or both. Still, the quantity of fluid contained in the pleural cavity is more frequently underestimated than the reverse, no matter whether the healthy lung is pressed upward and is floating on the liquid in a compressed condition, or whether, congested or inflamed, it is swimming in the midst of the fluid or adheres in places to the chest-wall. Thus, it is impossible to exactly gauge the indications for the operation according to the amount of effusion, Potain's assertion, that when the latter reaches the level of the clavicle the operation should be performed, is justified by the fact that the consecutive symptoms in the majority of such cases are very argent. In most cases we should not wait quite so long. In such persons as do not subjectively comulain, indifference is mostly due to lack of cerebral perception,-in conditions of unconsciousness during meningitis, typhoid fever, or idiocy. When the dalness extends high up both ameriorly and posteriorly, and no absorption takes place within a few weeks, the operation is required. The longer the compression of the lung has fasted the smaller will be the chances of its reinflation. It is true, however, that now and then it will re-expand after compersoion has lasted two or three months. Another serious fanger accompanying the pressure produced by the fiquid is the inactivity of the blood- and lymph vessels of the walls of the cavity; for in such a case total compression means absence of function (absorption). Thus, even a partial removal of the fluid, with partial relief to the vessels, is quite often the first stimulus to absorption and the commenoment of recovery.

In order to either make or confirm the diagnosis of exudative pleuritis, an explorative puncture is often resorted to; for, in spite of a number of rational symptoms, the positive diagnosis of a pleural effusion or exudation is sometimes impossible without its ocular confirmation. The puncture is made near the upper edge of a rib to avoid the course of the intercostal artery, while the hand of the diseased side is carried to the opposite shoulder to widen the intercostal spaces. The pain of the little operation is diminished by the quickness of its performance; besides, a slow introduction of the needle-particularly when of larger size-may peel off the pleura from the chest-wall. In many cases of copious extidation the place selected, within certain limits, is a matter of indifference. The puncture is mostly made where there is bulging, or a high degree of dulness, or more or less complete absence of respiratory murmur, frequently in the sexth intercostal space posteriorly to the axillary line. When these spaces are narrow, or when the patient is restless, it is not always easy to penetrate them; these are the cases in which, now and then, the intercostal artery has been wounded, or pain resulted from hitting the periosteum. When the point of the needle is not carried far enough, it may land in the chest-wall or in the thickened pleura; when too far, it reaches the lung; when in a wrong direction, it may be fastened in the liver or in the spleen. In such cases the needle is liable to participate in the excursions produced by inspiration and expiration, and, when withdrawn, will carry Nood instead of the contents of the pleural cavity. In rare cases it is possible, however, to exhibit the latter and still wound the lung. It has happened to me to extract pus from a pyothorax. On the very spot of the poncture the incision was made and a rib exsected; when the incision through the pleura was made, there was bleeding from the lung. The wound was closed with indoform gauge, a new puncture was made at a different locality, pus was found, the rib exsected, and again there was, on incision, pulmonary hemorrhage, which also was stopped by compression with iodoform game. A third puncture and a third excision at last led directly into the empyema. The failares were due to extensive pleural adhesions, and the deceptive results of the exploring punctures to the fact that the needle did not reach ous until it had perforated the adhering and twisted lung. Punctures of the lung need not result in hemorrhages, but there are enough cases of the kind to enforce the greatest care.

While an absolute diagnosis cannot always be made without a puncture, the results of the latter are sometimes not conclusive. Though there be plenty of liquid (serum, pus, blood) in the carity, it may not always follow the sucking piston. The point of the needle may first land in the lung after passing through liquid; this will enter the instrument only while the needle is being slowly withdrawn, provided again that it has not been closed by a blood-clot. Therefore, when the puncture is futile, the needle ought to be carefully examined as to its perviousness; or the needle is too thin for the contents; pus is quite often present where serum was expected; or the needle is caught in thick fibrinous deposits. That

may happen time and again, and lead to serious miscalculations and mistakes. Or the pleuritis may be localized, and result in an encysted empyema instead of a general pyothorax. Such localized empyemata are more frequently net with posteriorly, and upward (but sometimes anteriorly), than low down, where they are usually expected, on account of the fact that it is there that free pleural fluids are found. They are quite small sometimes, and not infrequently multiple, and therefore hard to find. Puncture after puncture must be made in such cases as yield all the rational symptoms of pyarmia, including leucocytosis in examinations of the blood, and when no pus can readily be detected. When finally found, it is not always certain to come from a pleural abscess, after all. It may be derived from a small pulmonary abscess, or from a pyopneumothorax. In the latter instance, however, and sometimes in the former also, there is often air (or gas) found mingled with the pus.

There are other possibilities of mistake. The needle may have withdrawn serum only, and yet pus or blood may be present; for in patients who have been in a recumbent or semi-creet position, as must with pleurities, the solid constituents of blood and pus will be deposited near the diaphragm. Thus, a microscopic examination ought first to complete the diagnosis of the nature of the pleural contents. When pus has been found, there is an urgent indication not to prograstimate the radical operation, for the puncture channel may become the cause of pos-infiltration, and possibly of pyaemia. Particularly is this so when the one is discolored and maledorous, as it is apt to be in cases of proporumothorax, or in those which are complicated with curies. The latter cases are apt to be attended by high temperatures (still, there are exceptions), the fever being either commous or irregularly intermittent. Such fevers require an exploring puncture at an early date; it is mostly delayed too long. Indeed, every case of uncomplicated pleuritis in which a high temperature is incessant for four or five days, mainly when complicated with much pain or local ordenia, becomes suspicious: Even as early as the fourth day I have met with large amounts of ous, not only in infants and older children, who are more apt to develop pleural suppurations, but also in adults. These are sometimes instances of double empyema. Though it is not frequent, it should be thought of in cases of unusual severity. Moderately high temperatures, however, do not necessarily indicate the use of the needle, for through periods of weeks temperatures of 1001/2" or 101" F. may persist without meaning anything but the systematic irritation caused by a perpetual process of absorption and elimination. Thus, after

all, there is no positive certainty that can be conveyed to the unthinking; here it is, as everywhere in medicine, that experience comes handy, when guided by brains.

Before the operation of puncturing is performed, the skin must be thoroughly washed (and disinfected); after the needle has been withdrawn, iodoform gauze, or hismuth subcarbonate (or some other disinfectant powder), or a sterile game is applied to the wound and covered with adhesive plaster or a bandage. If there be pain, ice is applied. At all events, the cliest ought to be at rest; the patient, if possible, in bed; no exercise or work permitted for a day. As a remedial agent a simple puncture is of no account. When recovery follows an exploring puncture, it is spontaneous, and not induced by it; for spontaneous absorption of the pleural fluids, both of transudations and excidations, is quite frequent. That is mainly so when the liquid is serous only and not too excessive; in the latter case, alsorption begins only when, by means of an aspiration, the pressure by which blood- and lymph-vessels are hampered has been in part relieved. Nor is it infrequent for hemorrhagic exudations, or even extravasations, to be absorbed after the solid constituents have been deposited on the surfaces of the plenne. Even the results of tubercular pleuritis may disappear, just as ascites caused by tubercular peritonitis is apt to get well whether or not tubercle bacilli are found in the fluid. As a rule, in most of the cases of spontaneous recovery no microbes are present; if they be found, they are mostly the shortlived cocci of Fraenkel. No such favorable event, however, need be looked for when the long-lived streptococcus and staphylococcus are present; still worse is the influence of protein vulgaris and mirabills in putrid empyena. Simple encysted empyenia, however, may finally heal without any operative interference, through a process of gradual inspissation and absorption; but it is not advisable to expect it or to wait for it.

Spontaneous perforation of pyothorax, either through the lungs or through the chest-wall, may lead to recovery; but it is slow, and takes place at the expense of much time, suffering, tissue, and usually of future health and vigor. It should never be wished or waited for. Other perforations may take place into the osciplingus, the pericardium, or the abdominal cavity. Thirty years ago I saw, with Dr. L. H. Sayre, an empyema we had to open in the right gluteal region.

Thoracocentesis ought to be performed soon after the exploring puncture. In many cases, when a mere aspiration is made, the operation appears simple enough; but it ought to be considered serious in all cases, as in many it is. The patient must rest quietly and be well supported in the position recommended for a simple puncture, and so that respiration and circulation are not unduly interfered with. The needle is inserted with the precautions detailed in the remarks I made on puncture; if it be caught by a fibrin clot, the latter may be elected by a probe introduced through the needle, but a second insertion may be required, probably anteriorly and superiorly to the first one. Aspiration alone will not cure empyems, except occasionally in infants, whose ribs are flexible and whose chests can be compressed more readily so as to approximate and adjust the walls of the abscess; even in them, however, the same operation must not be repeated after pus has again been formed, but a more extensive and radical operation is to be undertaken. Aspiration is always contraindicated in the empyema of adults, except in a vital indication for temporary relief, or when the fluid is hemoryhagic in character, or in cases absolutely inoperable by a more radical method.

During the operation the patient, if it be feasible, ought to be kept as much as possible on the diseased side, so as to avoid the dyspreza due to the compression of the long of the opposite side and the molestation of the heart. The fluid may be permitted to flow so long as the current remains equable during inspiration and expiration; the discharge must be stopped when the current begins to cease during inspiration. The relief given by the removal of a halfpint or a pint is sometimes considerable; but in young children. with their compressible chests and corresponding facility of accommodation to the expanding lung, it is safe and advisable entirely to empty the cavity. If the operation-because of the urgency of indications-be performed while expdation is still progressing, and dyspnora return, another thoracocentesis may become necessary within a short time. I had to operate twice within a day. If the contents be hemorrhagic (from tuberculosis, rarcinoma, alcoholism, nephritis, a rare occurrence in childhood), as little as possible should be withdrawn

The operation requires time. It is advisable to interrupt the discharge from time to time; for the too rapid entrance of air into the brenchi causes violent attacks of coughing (erroneously attributed to the needle irritating the pulmonary pleura), or the sudden rush into the expending lung may give rise to large quantities of scrous, strongly albuminous, brouchial secretion, or to copious pulmonary ordema, or to hemoerhages with slight surface lesions, or even to considerable rupture of pulmonary tissue. Fainting spells are also frequent during a rapid escape of serum, sometimes through psychical influences, sometimes from cerebral arcemia. In other cases (fortunately rare) thrombi formed in the compressed Jung, or in the impeded heart, or in the torn surface of the bronchi may be carried into distant blood-vessels; thus, emboli are known to have been swept into the pulmonary artery or into the artery of a fossa Sylvii.

After the operation the wound must be cared for as I suggested above, when speaking of the treatment of a mere puncture made for the purpose of a diagnosis. In addition, it is advisable to enforce absolute rest and to apply for some time an ice-bag to the part. This is particularly necessary when there is acute pain. Should this be severe, morphine may be used subcutaneously, but in uncommonly small doses, because its absorption is very rapid and its effect much more marked here than under ordinary circumstances.

The simple operation of aspiration does not suffice in cases of excutative pleuritis in which the pleural contents hold, or consist of pus, either laudable or putrid. As I mentioned before, pus may be found as early as the fourth day, and then it is often on both eiter. When high fever attends such cases, far from contraindicating a radical operation, they require it for immediate relief. If such telief be not obtained after a reasonable time, it is either because of a complication, such as pneumonia, pericarditis, or personitis, or of some pus concealed in a recess. The latter ought to be looked for and made to discharge; Nelson employed a metal sound for the purpose of breaking up adhesions and facilitating the escape of pus.

The radical operation consists in the making of a large aperture, either by a simple incision between two ribs, if possible, in the fifth or sixth intercostal space between the manufallary and axillary lines, or be incision with the exsection of a piece of rib from one-third of an inch to an inch in length, large enough to admit two fair-sized. drainage-tribes. The opening is insufficient so long as it gives no exit to the closs of fibrin, which are sometimes as large and peoplexing as their presence is unsuspected. It is on their ready and speedy removal that the duration of convalescence or the favorable or fatal termination depends. Therefore, they should be removed at the time of the operation. There is no better means than to dislodge them from the surface of the lung and of the chest-wall by the index-linger introduced into the cavity. During the following irrigation they are washed out or appear at the opening and may be exaght in a forceps. There are those who, as the presence or absence of these large masses cannot be diagnosticated, insist upon exaction in every case of empyona, no matter whether of recent date or of long standing At all events, whenever there has been a continued or a pyzemic ferer. a great deal of pain, an intercostal cedema, or a complication with infectious embolism, pyopneumothorax, tuberculosis, or superficial pulmonary or hepatic abocess, the exsection of a large piece of rib is indispensable. After the operation has been completed, the cavity may be thoroughly washed with quarts of warm saline (6 to 1800) or of Thiersch's solution. Stronger antiseptics should be avoided, or used only-largely diluted-when the fluid is decomposed. In the latter case irrigations are indispensable; they may be dispensed with altogether when pus is absolutely landable and the nations in a low condition. The dressing should be soft, thick, and aseptic. The frequency of the removal of this dressing and the number of injections depend on the nature and quantity of the pleural secretion. In the majority of cases it is safe to wait until the dressing becomesmoist. When the burgs expand readily, many days may elapse before the first dressing is removed and another one substituted. In most cases no irrigation is required after the one which terminates the operation. For the sake of thorough drainage, the patient should, however, be placed horizontally (the incision being the most dependent part) with raised hips, at least three times a day, and ordered so cough as hard as possible (Koenig). When, however, the pasis putrid, and in cases of complications such as are mentioned above. a daily change of dressing and daily irrigations, with occasional short interruptions, should take place. To expand the lungs and to promote. the required adhesion between the pleane, the child should amuse himself with blowing soan-hubbles, trumpeting, or with W. T. James's entertaining exercise. He is made to blow air into a bottle and dislodge the water (colored with fuclisin, methylene-blue, or such like) into another one by means of a simple system of rubber tubes. When fistulæ remain behind, or the abscess cannot close because of the lung being kept from expanding by pleuritic thickening over it, larger pieces of one or more rils must be removed to mable the chest-wall to sink in and thereby facilitate the approximation of the walls of the cavity. In these, as in many simpler cases, it is necessary to keep the opening patent for a long time; this is readily accomplished through the slowness of the growth of callus in that region. To render the expansion of the lung possible, J. D. Bryant (Festschrift) exhausts the air and empties the contents of the cavity by means of a closely fitting rubber apparatus, aided by adhesive straps.

The hemorrhage complicating the operation for empyema is rarely copions; but it should be stopped, as the patient is not in a condition to lose blood. A severe hemorrhage coming from numerous gramulations on the pulmonary pleura I had to stop by filling the cavity unmediately with large quantities of sterile gause. Other hemorrhages of the please may be due to the presence of neoplasms or to grave septic fevers. In variola and lend or phosphorus poisoning they may be complicated by fatty degeneration of the liver, the kidneys, the heart, and the pancreas. Others are angiopathic,—in hysteria, in obstructed general circulation, and in suffication.

Hydrothoras (fluid with a low specific gravity, less than tors, and from one to five per cent. of albumin) depends on or is complicated with malaria, nephritis, cardiac disease, anienta, or cachexia. The cases resulting from scarlatina are among the most favorable. Besides the indications afforded by its cause, and good nutrition, bydrothorax demands disrecties, such as digitalis, sparteine sulphate, eaffeine, disretin, and potassium bitartrate. The less such patients drink the more readily will the fluid be absorbed. Plenty of sodium chloride in food and drink will increase renal action. If no reduction of the fluid take place, paracentesis is demanded.

Presumetherax is a complication or a result of the perforation of a cavity, of pulmonary gangrene, of pleural infarction, or of perforating empyema, and in many cases of this kind pyopususethorax will be observed. Foreign bodies are more apt to produce purmothorax than whooping-cough, which is liable to tear the mediastinum rather than the pleura. Ice will relieve local inflammation and pain, so will opium, which, moreover, modifies the perturbed respiratory movements. Cases of pyopusumothorax which do not readily discharge their pun through the image demand a counter-opening of the elastical, which should be made, not under a general but a local anaethetic. Subcutaneous employment is occasionally observed in pyopusumothorax; it is a disagreeable but not dangerous complication.

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Diseases of the Organs of Circulation

1. The Heart.

Born in acute and in chronic diseases of the heart the amount as well as the quality of food require some modification. In many cases the loss or diminution of appetite will regulate the former. As a rule, however, the amount taken ought to be much less than the same person would take when in health. Not only ought the total quantity to be less, but also that consumed at each meal should be comparatively small. It is best, therefore, to divide the meals into halves and even thirds, so as to cause the patient to eat every two or three hours. Digestibility must be improved by slow eating. The disphragm should not be annoyed by large quantities of food or by the evolution of gases. Therefore but few carbohydrates (very little fat) are to be given at one time, and the digestion of nitrogenous foods, such as meats (eggs) and milk, with or without cereals, ought to be aided by pensin and dilute hydrochloric acid. The latter is an excellent adjuvant to the digestion of milk prepared according to J. Rudisch's formula (p. 34). Or it may be modified or mixed according to other rules given by me in the first chapter of this book. At all events, milk is the main food to be given in cardiac ailments. Its digestion has a further advantage in this, that it does not result. in the physiological congestion of the stomach, liver, and spleen, which becomes irksome after large and heavy meals by disturbing circulation and thereby adding to the labor of the heart, and that it sloes not contain the large mass of fat-forming elements present in the mixed food of healthy advanced childhood or adult agr. Altogether, it is best to slightly underfeed the patient; thereby the action of the beart is facilitated, -an object which must never be lost sight of. For the same reason fast drinking, even of water, must be avoided, for its sudden absorption fills the blood-vessels too suddenly for comfort, and its specify elimination does not diminish the momentary overwork. This warning is of particular importance as regards iced liquids, which act both by their holk and by reflex. This advice is by no means superfluous, either to medical men or to the sick. It was urged by Williams more than fifty years ago. Stokes prohibated the use of large quantities of somps or milk. And it has been again

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introduced by Ocrtel with such impressive emphasis that thirsning has become almost fashionable and a craze among the fanatics.

That stimulants, such as coffee, tea, and alcoholic heverages, must not form part of the regular diet in cardiac disease is self-understood. They may be required as medicinal agents, however, upon positive indications.

In every form of cardiac disease absolute rest both of body and mind is among the very first indications. The latter is just as important-perhaps more so-here as in diseases of the nerves and nerve-centres. Fretting, worrying, crying are detrimental, and must be avoided. Thus, it may become necessary to take a child out of bed, temporarily, to gratify and quiet him; or to change his position. for the recumbent position of an hypertrophied heart may cause dragging of the phrenic nerve or of the sympathetic plexus; or to raise the trunk and head to relieve intracranial hypergenia and the consecutive irritation of the pneumogastric nerve; or to give a mild opiate or a dose of potassium bromide to insure quietude or sleep The child must be permitted to select his own position; he knows best where he is most comfortable; but rest he must. The diseased heart is in its most favorable condition when weeking least; the number of heart-heats is reduced by ten or twenty-five in the recumbent position. Rest is not only a curative, but a preventive agent. Many a life-long cardiac affection could be warded off if care were taken in time. We are becoming more and more aware of the frequency of affections of the heart mincle. Myocarditis in a chronic, subscute, and acute form is of very frequent occurrence. In or after every case of typhoid feser, scarlatina, diphtheris, or small-pox we should be prepared to be overtaken by some cardiac disease, either interstitud myocarditis or parenchymatous degeneration. Rest in hed or on the loange (the former is better) will act as a preventive. It ought to be continued for weeks in almost every case. Like the paralysis consequent upon infectious diseases, which develops after weeks, heart disease may occur from the same cause, partly as a consequence of actual primary alterations, partly of nerve exhaustion. So long as the pulse becomes more rapid on exertion, or on getting out of bod, absolute rest is the best remedy and safeguard. In these cases it is not always possible to distinguish between functional debility and actual disease. Autopoles too frequently tell us of our matabes. Trifling changes in size cannot be measured by percussion, feeble murmurs cannot always be estimated according to their exact value. Functional murrants are not so frequent in the child as in the adolescent or the adult, and exceptional only in the infant. On the other hand, organic cardine diseases have a better chance to be cured—really cured—in the young than later. So much the greater is the responsibility of the medical man in cases of preventable or remediable cardiac disorder. Even patients suffering from the very worst forms are apt to feel better within a very few (hours or) hays after being confined to bed, with strict diet and loose and comfortable clothing. These cases teach us the lesson of what can be accomplished through the same régime in milder or incipient forms, by reducing the labor of the heart and at the same time of the voluntary muscles, with their influence on circulation and blood-pressure, and by diminishing the overactivity as well of the general innervation as of the cardiac nerves, both exciting and inhibiting.

It is difficult to decide to what extent exercise should take the place of rest in individual chronic cases. The hearts of nationts are as little alike as are their noses and finger-tips, and their treatment ought to be as individual as the size and shape of their gloves. Neither fit everybody. Nor is the rule adopted to-day that which will accomplish the best end in a month or a year for the same patient. The heart is neither in health nor in disease a uniform body. Its inservation may change from minute to minute, its nutrition is dependent on sudden or gradual alterations. A heart muscle is influescoil in its arrerial supply, remons discharge, and lymph circulation not only by its own health or disease, but by the ever-changing conditions of the other organs. Thus, many of the rules given one day may not remain valid another. Still, after a fair time has elapsed since the occurrence of an acute invocarditis or endocarditis, exercise should be recommended. The child may get up and have his quiet play sitting at the table, may begin to walk on the level floor, and may indulge in mild gymnastic exercise. More must not be permitted until the mucous membranes become a little more tinged, the arteries fuller, the heart quite regular. The systematic rules recommended by Stokes and by Oertel refer more to adults, with their incipient latty degeneration and chronic myocarditis, than to children. In these, while they bear the imprint of cardiac changes, no iron-clad rules hold good. Gentle exercise and long rest should alternate.

Gentle exercise may be replaced or complemented by massage of the skin and the muscles, both of which are so essential for circulation and metabolism. The blood circulating in a resting muscle during one minute amounts to 17.5 per cent, of its weight; in a contracting muscle to five times as much. It is easily seen to what extent massage, hydrotherapeutic irritation of the whole surface, and excitation of the muscles by the interrupted current must do good

without an exertion of the heart muscle. The avoidance of the latter, while the muscles are gently exercised by "resistance movements," is the peculiarity of the Schott treatment at Nanheim. It is indicated in a great many cases; in others it is Oertel's climbing exercises. In all it is the judicious mind and common sense of the physician in charge of the individual case.

The skin requires indicious attention. Exposure to cold, with its consecutive contraction of the cutaneous blood-vessels, overloads the viscera, retards circulation, and increases the labor of the heart muscle. A cold general bath, therefore, is dangerous (as also in the atheromatous degeneration of the old) in acute cardiffs (where local application of cold to the heart region acts quite favorably) or in extreme muscular weakness of the heart. On the other hand, a brief cold sponge-bath or wash, with thorough friction; is an intense stimulant and may be used to advantage for a weak heart, unless the extremities be cold and the mucous membranes evanotic. In these latter conditions, but washes and frictions, with or without alcohol, should take its place. In the average condition of the diseased heart general hot bathing must be avoided. It overstimulates and paralyzes, and proves an actual danger in both acute and chronic cases. Newspaper readers will remember the reports of people who go to the hot or " Turkish" bath with their heads erect and full of their own therapeutical wisdom, and leave it with their feet forward. A warm bath, the temperature of which ought not to be over 90" or 92" E., is often relished. In fact, both the talking child and the infant will soon tell you the exact temperature best adapted to their wante. In these cases actual want and comfort are identical. The baths, particularly the first, must be limited to a few minutes; at all events, they should never be continued after the slightest weakness of the pulse is noted. The debilitating or fatiguing effect of the bath must be avoided.

The mineral springs which have obtained a reputation in the treatment of chronic heart disease, like the German Nanheim and Osynhausen, over their effect to the stimulating action of the salts and of the carbonic acid contained in them. It should be remembered however, that not infrequently carbonic acid, both internally and externally, may cause tachycardia and arrhythmia.

Like but water, but air is contraindicated in heart disease. The wilted forms of the little ones soon show the effects of summer heat. A temperature of from 65° to 70° F, and fairly dry air are best for them. High altitudes do not agree with cardiac disease, particularly when no compensation has facilitated the heart's action. Com-

pensation is not complete until the hypertrophied left ventricle, having become so by mitral incompetency, transmits as much blood into the aorta as the pulmonary artery does into the longs. Until that stage has been reached, the lungs are comparatively hypertenic and subject to catarrh, ordema, or bleeding. In this condition, therefore, the influence of the traveled air of high altitudes should be avoided; as a rule, I recommend an altitude of not more than from one thousand to lifteen bundred feet to children affected with chronic endocarditis.

In the therapeutics of the heart it is most important not to mistake a functional disturbance of the heart's action for the immediate result of heart disease. The contractions of the heart (the pulse), as to number and rhythm, are more frequently influenced by disorders of other organs or of the organic economy in general. The pulse may become arrhythmic from cardiac (mainly myocardial) disease, but also from meningitis, from neuroses (chorea, hysteria, epilepsy), from aniemia in convalescence after grave diseases, in chlorosis, in universal obesity, even in the apparently healthy; from the auto-infection caused by constipation or by jaundior; or from the effects of medicines. It is self-evident that all these different causes, and not their common symptom, should be treated.

The functions of the heart and blood-vessels are best considered together, from a clinical point of view. Together they control the normal blood-pressure and circulation; when these are disturbed, it is mostly (not always) the same remedies or drugs that influence at the same time the heart and the arteries. Such disturbances are either an increase or a lowering of blood-pressure, and alterations in the circulation which are characterized by slowness or frequency of the pulse. In the diseases of the soung it is mostly cardiac stimulation that is required with a view of contracting both heart and arteries Its indication is furnished by primary feebleness of the heart muscle, or by that which is secondary to acute or chronic inflammatory or infectious diseases, or meningitis; sometimes by congenital undersize: by impaired brain function after hemorrhages, in syncope, or in chronic cerebral anaemia; in tedious convalescence; by insufficient diuresis; by pulmonary ordema; by reflexly lowered blood-pressure in shock, in colic, or after extensive burns; by hemorrhages; or by toxic dilutation of blood-vessels caused by chloral hydrate, nitrites, pilocarpine, or muscarine. Angina is, fortunately, very rare, for acute or chronic aortifis is very uncommon. Whenever it occurs it may cause a neuritis of the cardiac plexus near the coronary arrery and under the influence of peri- or (and) myocarditis.

Blood-pressure and circulation are improved by physical means.

such as transfusion, salt-water infusion, lowering the head and raising the feet, ligature of the extremities, manual compression of the abdominal aceta, and hydrotherapy in different forms. The centres of the medulla and of the spinal cord are influenced by stryclinine and ergot; the vasomotor centres and the heart by caffeine, camphor, ammonium, and musk; the vasomotor centres and the periphene vasomotor nerves by hydrastis; the heart by alcohol, atropine, and sparreine; the heart and arteries by digitalis, strophanthus, adonis, convallaria, hellebore, and apocynum.

Among the principal remedies employed for the purpose of reducing blood-pressure and dilating peripheric vessels are warm boths, or doot-baths with or without mustard, warm clothing, rest in hed, nurcotics, such as morphine and chloral hydrate, acids and alkalies, and the nitrites.

At the head of the list of heart and blood-vessel stimulants stands digitalis. It increases the action of the heart muscle and thereby increases cardiac pressure. It is indicated in all conditions of weakness of the heart muscle so long as the latter is not decomposed and the arteries are in their usual structural condition. Primary changes of the heart muscle hardly ever occur in childhood, for uncomplicated fatty degeneration, in which digitalis is contraindicated. is almost unknown at an early age. Secondary parenchymonous degeneration is, however, a frequent occurrence in and after infectious diseases, such as typhoid fever, dysentery, rheumatism, scarlatina, diphtheria, and others. Digitalis is useless and sometimes worse than useless in nervous affections, such as the palpitations of Graves's disease, of neurasthenia, or of hysteria. In all probability the effect of digitalis is mostly felt at first in the left ventricle, which is more muscular, but in the right ventricle almost as soon. By acting on the left ventricle it regulates the general circulation and facilitates aspiration of the venous blood and the circulation in the lungs and in the right heart. It strengthens the systole and lengthens the diastole. During its administration the contractions of the heart. become more vigorous and less frequent, the arterial pulse slower and fuller, the urine increases in quantity, evanosis and dyspaces diminish, and dropoical symptoms gradually disappear. When large doses have been given for some time, accumulation of the effect takes place. The pulse becomes quite slow and irregular, and vomiting sets in. If possible, this effect should be avoided,

For how long a time may digitalis be administered when given in moderate doses? This question has often been asked and as often answered. Unfortunately, the proporations sold in the markets are of different strengths and vary too often: as it is best to rely on preparations which are not liable to spell on one's hands. With that proviso, I can say, from an experience of several dozens of years, that I cannot agree with those-who stop the administration of digitalis after a few days, to begin again after an intermission. Moderate doses may be given day after day for months without any iil effect and with great benefit. Nor is it necessary to alternate between cardiac stimulants so long as no incomfortable effect of digitalis makes its appearance. Only when the pottent cannot be seen for many weeks in succession, the practitioner may feel like alternoting digitalis and strophanthus weekly.

In practice we are often disappointed. The preparations are as various as are the firms of wholesale, or sometimes retail, manufacturers or tradesures. The United States Plasmacoparia is, after all, the best stand-by of the practitioner, and its list of drugs and that of the National Formulary of the Pharmaceutical Association are sufficiently large to suit any taste. The infusion of digitalis, when reliable, may be given to a six-year-old child in doses of a teaspoonful two or four or five times a day, the fluid extract (I have often expressed my predilection for "Squibb's") two or three minims daily, the solid extract from one half to one grain daily (0.03 to 0.06). They are not equivalent, the infusion being weaker by containing the digitonin, which is highly soluble in water and acts rather as an antidote to digitalis and digitoxis. The tincture of digitalis, when reliable (not fixed up by mixing a poor "fluid extract" with alcohol), ought to be a competent equivalent of the fluid extract, if both be made of the English leaf gathered in July. It has been found that when digitalis, though English and gathered in midsummer, is kept, the preparations made of it later lose in strength, so that those made nine months afterwards display only one-third or one-fourth of their origmal power. The main constituent is digitoxin; of it there is less in sunless summers, to such an extent that it varies from 0.1 to 0.62 per cent. of the herb. Görges (Berl. Elin. Wock., August 13, 1902), for that reason, recommends a dialysate (made by Golaz in Saxon Switzerland) of digitalis purpures and grandiflors, of which children of two or three years are given from two to six drops three times a day. Indeed, children bear digitalis and cardiac stimulants generally better than adults, and in comparatively larger doses. Digitalin I have used a great deal. Unfortunately, the wares sold by that name are very inequal: they are resinoids, not alkaloids, I have used ten or twenty times the doses recommended in books and price-lists without any effect whatsoever that could be relied

on. For many years I have given it up. In urgent cases a sixyear-old child must take from one to five minims of the fluid extract at once. That dose may be repeated after a few hours, and perhaps again, until the effect is perceptible. Then it is time to slacken off or stop altogether. It is particularly in those cases in which the pulmonary circulation is obstructed, either by local pulmonary inflammatory processes or by cardiac incompetency, that this mode of proceeding is advisable (p. 431).

The effect of digitalis is not limited to the heart; the arteries are also affected by it. On this account digitalis is often contraindicated in senile affections of the whole vascular system. As they
(atheronatous conditions) are not found (except in a few cases
of the interature) in infancy and childhood, this contraindication is
tare in early age. There is a single exception, however, to this rule,
—viz., in absormal congenital smallness of the arteries, which is
not so excessively rare as may be presumed, and is a frequent cause
of life-long migraine, neurasthenia, hysteria, and chlorosis. In these
conditions, thus caused, digitalis is not so well tolerated when given
by itself. It acts better when combined with a nitrite.

In those cases in which the effect of digitalis appears to be retarded, or the practitioner has "reason to doubt the qualities of his drug," another one may be substituted for it or combined with it I plend for occasional combinations of drugs. The "simple prescription" flag of the "one drug only" fanatics waves over a childish affectation. They forget that they are prescribing half a dozen different constituents in their "one drug" digitalis. Moreover, when the heart requires stimulation, we should remember that it is a composite organ; the muscle, the ganglia, the pneumogastric, sympathetic, and vasomotor nerves are suffering simultaneously. The tincture of strophanthus may be taken by the same child to the daily amount of from six to twenty-five minims; the fluid extract of convallaria majalis in the same or somewhat larger doses. Again I suggest that in most cases it is best to ascertain the moderate dose to be administered a long time in succession by giving a good dose from the very beginning and watching its effect. Of sporteine sulphate (better than other preparations of scoparius) eight or ten doses are required duly, altogether amounting to from one-half to two and a half grains (0.03 to 0.15). Caffeine from two to ten grains, or sodio-caffeine salicylate (or benecate) from four to fifteen grains a day, are fair doses, the effect of which will be pleasant in most cases. In a former chapter of this book (p. 70) I alluded to the subcutaneous use of the latter; it dissolves readily in twice its weight of water

and is not a local irritant; it is therefore easily employed. The effect of these injections is often marked. Nearly twenty years ago I published a case of cardiac pulmonary ordema, among others, in which recovery was the undoubted result of their use. There is, however, a positive contraindication to the use of caffeine (and coffee),-viz., cerebral hyperzenia, either active or passive, or a andency to consulsions. The same contraindication holds good for stryclinine sulphate, which has conquered a trusted place as a cardiac stimulant. If there be time, it may be given internally, daily, to the amount of from one-sixtieth to one-twentieth of a grain (0.00) to 0.003) for many days or weeks in succession. Urgent cases require its subcutaneous administration. Large doses, up to one-fourth or onethird grain (fifteen or twenty milligrammes), may be given to a child of ten years, in emergencies of collapse and sensis, in a day, but such doses must not be continued, except in thorough sepsis. Sodio-theobromine salicylate has been introduced (as "diuretin") by G. See. It is a distretic rather than a cardiac stimulant, and, unlike the former, is often found wanting. It appears to act principally on the spithelia of the uriniferous tubes. Calomel in small doses is certainly a cardiac sedative, and, as it is surely a diuretic, it is entitled to the many praises bestowed on it by the older rather than by modern physicians. Salines owe their effect upon the heart mainly to their action on the digestive and the urinary organs, with the exception of the bromides and iodides, the former of which act as relatives, and thus save labor and soothe irritation. Potassium indide has a more direct effect. It dilates arteries, diminishes arterial tension, and aids elimination through the bronchial mucous membranes and the kidneys. Obstructions of the pulmonary circulation depending on the heart are its appropriate indication. Sclerosis of the commany actories is not, or hardly ever, found in the young; therefore this is an indication exclusively belonging to advanced age. A child of six years may readily take from five to twenty grains (0,3 to 1,25) a day, in three or four doses, in plenty of water, after meals. It need not often be interrupted because of the gastric symptoms produced. The nitrites and their preparations play an important part in lowering blood-pressure. They dilate blood-vessels by paralyzing the vasomotor centres (not the central nervous system), mainly the peripheric vessels. Large doses transform bæmoglobin into methemoglobin and thereby cause cyanosis, dysonera, and sometimes methamoglobinuria. Amyl mitrite may be inhaled in drop doses; ntroglycerin (trinitrite, glosoin) is given in doses of from one-fivehundredth to one-two-hundred-and-fiftieth grain (one-righth to onefourth miligramme) in solution. The spiritus glonomi of the United States Pharmacopena contains one-one-hundredth grain in one drop. The effect of sodium nitrite, from one to four grains (0.00 to 0.25) a day, as solution or in powder, is milder but more permanent. Sweet spirit of nitre is of an inequal composition; its action on the kidneys is more pronounced than that on the circulation in general.

There are occasional cases in which the secondary compensation required by mitral incompetency is not fully satablished, and serious-listariumnes of the circulation arise therefrom. The dangerous symptoms may be cyanosis and polineauty (or) and cerebral orderna. There are, besides, stupor or conventions, dysproen, diated vests, and extremities, and a small and intermitting pulse. It is in these cases that a few of the above-mentioned large does of digitalis may to good; here it is that wavering and indecision become criminal. Whenever digitalis does not have any effect, a rensection may. Our ancestors were tree possiblanimous. Maybe they overdid bleeding, but in an irrgent case they did not fail to open a vein. I know that I have soveral times saved the lives of children (and adults) by opening a rein outcide.

Chronic (and sometimes the final termination of acute) cardiac diseases may feed to heart-failure. In such cases stimulants are inficated. Alcohol must not be given by itself and in large doors in cerebral hyperennic of any kind. A child of six years may take from three to twenty grains (0.2 to 4.25) of camplior internally; subentaneously, a solution of one part in five of sweet almond oil should be used, and from five to fifteen drops injected repeatedly. Effecmay be given, in doses of from three to ten drops, in alcohol and water, and ammonium carbinate, in frequently repeated doses of from one-half to two grains (0.03 to 0.123), in anise-seed water to in milk. Musk internally, strychnine subcutaneously, may be required. The more organis the case appears to be the greater is the indication for combining several of these remedies.

Myscandinis.—Though myscarditis, both sente and chronic, is far from being so common in the child as in the adult, it is nevertheless not infrequent; it is, indeed, remarkable how often it is not diagnosticated, or how little its occurrence is appreciated. Its symptoms are, it is true, sometimes very few. It need not be universal; in many instances the lesions are local only, in many others very marked, so as to lead to segmentation and fragmentation of the fibres (Hektorn in Auer. Jour. Med. Sci., November, 1857). The disease is met with either in connection with endocarditis, pericarditis, very often with elementation, etc., or is quite frequently uncompli-

cated. Then it is parenchymatous, and the result of the toole influence of infectious fevers (diphtheria, influenza, typhoid, dysentery, etc.).

In its treatment muscle stimulants must not be given. Digitalisis contraindicated. The recommendation of Heffen, to administer ergot. I cannot approve of, for by its action on the emiscular films a increases vascular pressure, and thereby secondardy the labor of the inflamed heart muscle. Whatever relieves this temporarily is welcome. Therefore, possssinm or sodium iodide combined with a bromide will act favorably. Here is also the place for morphine, either in large doors at long intervals or in small doors more frequently administered, together with ice to the chest. During attacks of collapse, or sluring weakness or prostration, other, camphor, and alcoholshould be given, either internally or in an urgent-case schemaneously. A dose of calomel will relieve the bowels. Enemata for the same purpose daily, for regular evacuations are the best regulators of intraabdominal circulation. In chronic cases iron may safely be given with the iodide; not in acute ones, which are injured by it through the increase of vascular irritation. Absolute rest, both physical and mental, is essential. That is why Oertel's and Schott's teaching of systematic exercise should be followed with great care only, even in chronic cases. The extremities should be kept warm (stockings) and ice-bags or wet cloths applied to the heart. Derivation by extensive unistand-plasters and by hot foot-boths taken in a semi-recumbent position should be tried. A very small pulse demands nitrites. The usual cardiac stimulants, such as digitalis, strychnine, etc., are contraindicated, particularly in cases of arrhythmia or gallop rhythm when referable to myocardial weakness.

Acute dilatation of the heart is now and then encountered after the parenchymatous changes of the heart muscle following infectious flistases. Foretheimer (Festschrift) studied it in connection with influenza and its etiology as myocardial and nervous, both the muscle and the nerve degenerating under the influence of a toxin. In children the myocardial insufficiency is the cause of the dilatation, rarely tive versa, and the latter should be met with absolute rest extending over weeks or months, warm bothing, iodides and nitrites, and opiates.* Recovery is much impeded by concomitant pericardial adhesion.

^{*} P. Parchheimer quotes Charles West, who absenced forty years ago in inflience a combination of symptoms, of which dispress was the principal one, disappearing in two or three days, followed by "extreme depression, cool-

Endocarditis.-That it is " never primary" is a mistake shown by Henry Hun in Festschnift. "Our forefathers knew that rhenmatism might begin in the heart." On the other hand, heart diseases are rarely uncomplicated; endo-myo-pericarditis, this complex of varieties. is often found in combination, and the "carditis" of our predecessors was a good diagnosis based on truth. The treatment of this disease is more promising in the child than in the adult, for entire recovery is more frequent in early life than later; but it is important that the diagnosis should be made early. In order not to be taken mawares. we ought to remember that many a systolic murmur that is mistaken for endocardial is myocardial, and that endocarditis may be present without, at least for some time, exhibiting a murmur; there are, indeed, cases which run their full course without a murmur. This is eminently so in ulcerous endocarditis (ferer irregular, mummer changing, sometimes quite absent, symptoms (sometimes fulminant) -Henry L. Elsner in Festschrift-of malaria, tendency to embeli not infrequent after gonorrhera, and then not quite so had prognostically as is suggested by S. S. Adams in Festschrift). On the other hand, it is also necessary to remember that functional murmurs are not so common in the child, particularly in the infant, as they are in the adult. Thus, every murmor-though there be no hypertrophy developed as yet-should be suspected of being dependent on organic disease. This may also be surmised in most cases of acute chorea, which sometimes precedes and ushers in, instead of following, endocarditis; and in every case of articular rheumatism, the symptoms of which have been described in a former chapter of this book as sometimes so slight as easily to be overlooked (p. 251). Arme endocarditis is also common as a sequela of the chronic form and as part of septico-pyrenia. It is not uncommon as the result of acute and chronic neubritis, and of infectious diseases, such as scarlatina, measles, typhoid fever, variola, tuberculosis, and carcinosis, and is frequently complicated-mostly through the intercession of pericarditis-with pneumonia and pleurisy, also with perihepatitis, perisplenitis, and generalized crythema. Frequent and careful examination, therefore, during the existence of such adments, while it facilitates an exact and complete diagnosis, suggests the best method of prophylaxis. Most of the cases of endocarditis we

moist skin, a very feeble pribe, and labored respiration. . . In this condition the children, though quite conscious when restord, lay generally decing, while, though the somewhat livid has of the lips and surface second to keply the exactnice of some serious mischief in the lungs, there was nothing to be heard but a large moist rile."

meet with in children being due to acme rheumatism, every case of the latter, though ever so slight, must be watched, put to bed, and treated with sodium salicylate, which may be given a long time after apparent recovery, or resumed with every new attack. Almost every form of "growing pain" ought to be so treated, and in no case of infectious disease must the patient be permitted to leave the bed before much of his previous strength has been restored.

The special treatment of acute endocarditis requires absolute rest in bed, a dose of calomel sufficient to open the bowels, and regular discharges through the course of the disease by means of epemata rather than of purgatives. Frequent but small meals, and articles of food as suggested above. If thirst be great, drinking should be permitted often rather than much at a time. No alcohol in the beginning. Depletion by looches is rarely indicated, and then only when there is a serious complication with painful plentisy. In rheumatic endocarditis depletion is not tolerated. For severe pain which depends on plental complication the subcutaneous injection of a few drops of Magendie's solution of morphine is preferable. Dry or wet cupping will sometimes relieve in such cases; other derivants, such as sinapisms, will often suffice. Vesicatories I do not advise in an acute case, the patient having enough to suffer from nature's infliction. Ice applied in a bag, which must not be too heavy, or ice-water cloths well wrung out, are beneficial in most cases, rhenmatic or other. The head and trunk must be raised so as to make the patient as comfortable as possible. Blue continent has been recommended over the heart and other places, but I cannot say that I have reason to advise it. Strong dinretics, such as act by increasing bloodpressure, must not be given; mild salines will answer best; a small dose of calomei may be given from time to time. According to the indications noted above, potassium iodide, with or without an opiate, will answer best, in doses of from fifteen to twenty-five grains (1.0 to 1.75) daily, for a child of six years. An opiate at night secures rest; potassium bromide may be given through the day. If the case be thenmatic, as it mostly is, sodium salicylate, from fifteen to thirty grains (1.0 to 2.0) daily, will be tolerated and found serviceable. Phenacetin may take its place sometimes, in daily doses, all told, of from five to ten grains (0.3 to 0.6). It acts as a febrifuge, an antirheumatic, and a sedative at the same time, better than quintie, a dose of which may, however, answer well now and then, particularly during remission. Antipyrin rarely, acetanilid ("antifebria" of the trade) never. Aspirin (soluble in alkalies, therefore not affected by the stormech) may be given in endocarditis when it is, as usual,

rheamatic, in three daily doses of from eight to fifteen grains to.s. to (.0) each. Serious attacks of dysprico are bost relieved by intrphine, either internally or subcinaneously, or by lead and opinm Drastics will seldom be required and seldom answer the purpose. The nitrites may be tried, though they have not served me so well, or so often, as I formerly thought I had reason to expect; they act best when the pulse is thangerously small. When cachesia and debility are prominent symptoms, tonics and stimmlants are indicated early. In had septic cases chloride of iron may be given at an earlier period. When streptococci are found in the blood, the antistreptococcus serum (Manuorek) may be injected in repeated doses of from five to ten enfor centimetres daily. Crede's continent should be used at the same time, fifteen grains once or twice a day; subcutaneous injections of yeast and of unclein have been recommended. Among the stimulants, I think highly of camptor and ammonium. Among the direct cardiac stimulants enumerated above, digitalis ought to be given only after the acute changes in the muncular tissue of the heart. have been repaired. (There is hardly a case of endocarditis unsecompanied by myocarditis.)

It is here that the experience and tact of the practitioner sunst decide an important point. In the further evolution of the case, digitalis with quinine, digitalis with belladoma, digitalis with strychnine, or with a broadde, or with an todide, together with stimulation of the peripheric circulation by friction, either day or with alcohol or hot or cold mater, find their own indications.

The hygienic treatment of chronic endocarditis has been disposed of in former remarks. The medicinal agents of most importance are digitalis and from. Constipation and overexertion must be avoided. In connection with the latter, the education and training of the child should be so guided as to prepare him for his future trade, hustness or vocation. As endocarditis terminates so often in valrular disorders with consecutive hypertrophy, his future life ought not to be exposed, if avoidable, to great excitements or hard physical labor. A child so affected must not take coffee, bea, or alcohol in any shape as an article of diet. He must not be trained to become a military man, a pogilist, or a medical practitioner.

The management of valvular changes resulting from endocarditis is more successful in childhood than in the adult. Compensation is brought about by consecutive hypertrophy; thus it is facilitated, about pulserty, by the rapid growth of the heart at that period of life, and particularly by the increase in size of the aorta and also of the arteries in general, thereby easing the circulation. Besides, purely vascular disease, which is so common in the adult, is a rare exception in the child. Moderate exercise contributes its share in increasing the growth of muscular tissue of all kinds, and should be recommended, according to Beneke," as also in undersize of the heart.

Pericarditis.-The pericardium is more accessible to the influence of cold applications than the heart. They generally act well; but we must be prepared to meet with doubtful or no success in many cases, for pericarditis is but rarely a primary or uncomplicated disrase; indeed, it is more frequently fatal on account of its complications than of effusion. Myocardial changes (fatty degeneration mostly in the adult), acute ordens or acute inflammation of the myocardium in acute articular rheumatism, chronic interstitial myocardicis, or tubercle, or syphilitic gumma, or complications with purulent mediastinitis or pleuritis, are not uncommon. In preumonia. pleuritis, and scarlatina pericarditis is not unusual; in rheumatism frequent. The internal treatment of pericarditis is, therefore, in part directed by the complications. Digitalis is indicated mainly in cases which are rather complicated; strophantlms, convaltaria, and potassimm indide may take its place or he combined with it, according to the suggestions made above. Morphine is demanded in most cases, if only to give rest for the night. The ferer may require phenacetin, aspirin, sodium salicylate; or (during a remission) sprinine. After the fever has disappeared, or while it is waning, absorption of the effusion may be promoted by caffeine, sparteine, disretin, iodides, and a vesicatory over the heart. Effusion into the pericardium is not often so conious as to produce suffocation, but I am afraid that puncture. of the pericardium to relieve the fatal pressure is not made so often as it ought to be. Fortunately, errors in the diagnosis are not very easily made; still, they do occur, for I have been called to perform paracentesis of the pericardium where there was some pericarditis, more hypertrophy of the heart, and much pleuritis. The operation

^{*}From birth to the sesuath year the volume of the heart increases from twenty-three to one fundred cubic continuetres, by no means in proportion to the weight of the hody. Still, this increase is very much greater than that of the lamen of the arrestic when compared with the length of the body. The palmonary artery is wifer than the area until patterny: alterwards they are equal or the area becomes larger. The inficiarian arteries and the coursess taxotids are very wide compared with the length of the body (thereby raining physiological and pathological congestion) of the cranium and its contents). Between seven and fifteen years the volume of the least is from one handred and thirty to one furnities and forty rathic continuetres; at that time the large atteries measure in absolute width.

is not difficult, the liquid being so copious as to give the heart ample space to recede in a semi-recumbent position. The aspiration should be made in the left mammillary line, in the sixth intercostal space. In the same neighborhood, at the upper margin of the fifth or sixth rib, the incision is made to remove pus, and irrigations may be made afterwards. Dramage has also been established in such cases. If at the same time there be pus in the pleural cavity, it may become necessary to select another spot for the perscardial operation. A. Fraenkel recommended it on the right side of the sternim. The heart has been punctured during the aspiration without evil result; but I am not prepared to say, even with Biedert, that "the puncturing of the heart is not connected with any danger."

Hydropericardism, no matter from what cause, must be treated on the same principles as those which are valid for hydrothorax.

Syphilis of the pericardium and of the heart, if diagnosticated or suspected, require their own specific treatment.

Neurous of the heart are not so frequent in the child as in the adult. The disphragm, on account of its higher location, may among the heart in tympanites; undue motility (ptosis) of the heart may be congenital; solidification of a hing may render posture on the opposite side difficult and cause tachycardia or arrhythmia; early chlorosis or Graven's disease, alcoholism, the use of coffee or tea, manufaction, and early neurasthenia, often on an hereditary basis, may cause—mostly about the time of puberty—all the symptoms of slow, fast, or irregular heart's action. The treatment should meet the causes: cold water washing and bathing, cold applications to the heart, moderate gymnastics, no sedentary life, little schooling in the usual meaning of the word, codeine one dose for the night, sedium beomide or monobromated camphor in a few doses daily, enema daily, a purgative occasionally, physical and mental hygims.

Congenital assessities of the heart claim attention from the moment of birth. The newly-born candidate for cyansosis is liable to suffer from asphyxia, the rules for the treatment of which need no repetition here. When the troubles, being the result either of embryonic arrests of development or of feetal inflammations, prove incurable, almost the only thing to be done for the little sufferers is to protect them as much as possible. If they be so unfortunate as to grow up, exercise should be avoided,—indeed, is avoided. Alcohol is indicated in conditions of collapse only; no blood must ever be taken: laxatives should be sparingly given if at all. The temperature in which the little waifs are to live ought to be equable, moderately warm, their wearing apparel warm and comfortable. Congestive disorders which would require the use of cold in otherwise healthy children must mostly do without it, as the patients seldon bear it. Mild regetable acids are covered by many. Only those who appear to develop hypertrophy of the heart should take digitalis or strophanthus, provided their effect on the arteries need not be feared. Small doses of an opiate will often relieve their discomfort and dyspacea. The combination of digitalis with indides, administered for months in succession, gave relief in a number of cases in which the patients lived four years or more.

There are anomalies of the infant heart which are congenital, or nearly so, and still not comparable in dignity to arrests of development. Rheumatism, scarlatina (rarely), or inflammations of some intrathoracic viscus, when contracted in early life, may result in cardiac complications. They are on the left side of the heart (while fertal endocarditis affects the right half pre-eminently). Harvatosus at the free margin of the mitral valve is formed immediately, or soon after birth, below the endocardium. It is liable to disappear, and with it, by recovery, or by compensation, or by increased frequency of the cardiac movements (by which the blood-wave becomes smaller and the valve excursion shorter), the systolic mitral marmor caused by it (like that which is caused by rhermatic endocarditis); but excrescences, hard noduli (Cruveillier), cicatrization, and insufficiency of the mitral valve may persist (Luschka, Pirck Arck, vol. xi.). The latter is easily diagnosticated and requires the usual treatment of acquired chronic endocarditis. As blood-nodular on the cardiac valves, Berti (last in Arch. J. Kinderheilk., vol. xxxi., 1901) describes what he takes to be, not hemorrhages, but ectasias and cysts and evolution processes of the valvular tissue with disappearance of the vascular net. Treatment as above, if any,

The ductor arteriosus Botalli becomes nearly obliterated within two weeks, entirely within three months, by the aspiration of its blood into the newly opened lungs, by its being bent by the traction of the lungs, by the proliferation of the spindle-shaped cells of the traica media, and finally by thromboois. Theo, Escherich (Fest-schrift) describes, in cases of patency of the duct, sudden attacks of shallow or absent respiration, cyanosis, bulging eyes, swelled lips, slow heart action, and tonic contractions of the extremities. His treatment consists in B. Schultze's method of treating asphyxia (p. 83). It is to be repeated many times daily, without much exertion, just enough to loop the lungs acting.

Plour of the heart (dislocation downward) has been observed with epigastric pulsation as the result of weakness of the connective

tissue of the great results which sustain the heart. Varieosities and schrosis were noticed as consequences. Possibly a proper epigastric support may have a good effect. Four cases of Ferannii (Centralis, f. ion. Med., January 6, 1899) were complicated with mitral stenosis, small size and asymmetry of the cranium, feeble bones, stunted growth, and deformed chest and extremities; once with mental weakness.

Congenited undersine of the heart does not appear to be so frequent as that of the arteries. Indeed, in many cases of undersized arteries it was found of normal size, or somewhat larger. In the latter case the heart was not always hypertrophic; on the contrary, in most instances there was some fatty degeneration of the flabby muscle. Like every small organ, the small heart may be built up by moderate and persistent gymnastic exercise, a small dose of stryclinine given three times a day for weeks or months in succession, cold washing and friction, and an altitude of from one thresand to fifteen hundred feet. A certain amount of muscular growth will probably result from it; it is quite welcome, for the labor of the heart requires either an organ of sufficient size or one of unusual strength.

Neoplarms of the heart (carcinoma, sarcoma, fibronia, myema, lipoma, mysoma, tuberele, echinococcus, cysticerens, and syphiloma) are rare in early life, the last named more frequent than the rest, and the only one that so far can be reached by (antisyphilitie) treatment.

2. The Blood-Petrelt.

The structure of the blood-vessels is sometimes very defective, the walls being thin, fragile, and pervious. In such cases hemorrhage, small or copious, is a frequent symptom. The frequency of hemorrhages in the newly-horn, leading, when in the cranial cavity, to asphyxia, convulsions, idiocy, or early death, is, among other reasons, caused by the thinness of the vessel-walls, whose tissue has not yet quite evolved from its embryonal condition. This, or a similar condition, may continue for life. This hypoplastic state, however, is not, of necessity, general: it may be local. The early nose-bleedings of some, though they have no heart disease, and the congenital tendency to aneurism, mostly in places where the elastic tissue, either from arrest of local development or by microbic destruction, is either scanty or absent (usually at the origin of branches, Eppinger), peove the occational occurrence of these circumsteribed and local defects." A antiform

^{*} A. Jacobi, Extracranial Ascerton in Early Life (Trans. Tenth Internet-Med. Cong., Berlin, (Sur.)

thinger of many or all of the arteries, however, is most likely to be complicated with narrowness, which has been studied by Virchow, See, and others in its relation to incurable chlorosis, palpitation, and cardiac asthma. That thinness which predisposes to fatty degeneration of the intima and media, to schemes of the adventitia, to atherematous endarteritis, and to the formation of ancurism at an early age has not been made the subject of active treatment, so far as I know, except by myself. I feel convinced that the administration of phosphorus,-not phosphates of any kind,-with its stimulant effect on the growth of connective tissue in general, has rendered me good service in habitual tendency to cutaneous, mucous, and internal hemcertages. Hamophilia of moderate degrees appeared to improve under its use, and the children to be safer and better developed. The dose for a child of three years should be from one-fiftieth to onethirtieth of a grain (0.001 to 0.002) daily; that means from two to three minims of the oleum phosphoratum, or from one to one and a half teaspoonfuls daily of the clixir phosphori (United States Pharmacopacia of 1800).4

Atherometous degeneration of arteries, large and small, in babies, children, and adolescents is rare, but cases are from time to time reported. In another part of this book I have spoken of the recommendation of lactic acid in these conditions. Syphilitic vascular changes require their specific treatment. Taberculosis of blood-vessels, mainly small arteries, has been known a long time. Bacilli enter through the lymph and the blood circulation, are frequently perivascular first, and find their way into the intima.

Thrombouts of seins in general, and of the sinuses of the dura mater in particular, is the result of retardation of the (general or) local circulation and of congulation of blood by marasmus from whatever cause; rapid elimination of water (cholera infantum), debility of the heart, pressure on veins, or inflammation in the neighborhood (for instance, caries of the petrous bone). In the same way throm-

^{*}The unreliability of the percentage of phosphorus when dissolved in oil, and ainticularly in cod-fiver oil, is the came of the ill success in the hinds of observers and of the clouds of European magazine articles that rain down on the profession. If they would only use, now and then, the preparations of the U. S. Pharmacopean! Blue, who favors phosphorus therapenties (mainly in stachins), recommends a method to determine the percentage of phosphorus in oil solutions (Centralbt.), inn. Med. November 14, 2022). A phosphorus solution which is invisible in the dark becomes wishle when scanned. Such solutions to contain little aboutherus require a relatively high temperature for that end.

10

bosis of the femoral vein may be earned by peritonitis or by a petvic tumor (or by fractures not set). In the cranium the right transverse simes is most frequently affected, but quite often also the inferior petrous, enversors, and longitudinal sinuses. Such thromboses cause hyperamia, ordema, or extravasations; it is by their symptoms that the diagnosis is made. The treatment must be preventive in order to be successful. Early attention to the sar and mastod process, treatment of diarrhea before inspissation of the blood and heart-failure take place, timely stimulating and roborant treatment, and not prove a nata,—that is, when it is just a little too late,—are the best preventives. The subcutaneous injection of large quantities of warm sterilized water, with sodium chloride (100s to 7), is capable of preventing the inspissation of the blood which results from acute and copious diarrhea, and often proves life-saving.

Welch refers a number of venous thrombones to cardiac diseases (Festschrift), mainly to advanced mitral affection with failing compensation, tricuspid insufficiency, and pulmonary infarctions. Flexner asserts the frequency of terminal bacteric infections in heart diseases. All this preaches the sermon of preventive treatment (and curative so far as possible) of cardiac and of infectious disorders.

Congenital local dilatations of blood-vessels, capillaries, smallest veins, and smallest arteries, together with an increase of their number, and mostly with incompetent structure, are known by the names nouse, telimpiretaria, augionia. Their color depends on the nature of the blood-vessels composing the anomaly, also on their distance from the surface, their size on the extension of the morbid process, and their size and consistency on the admixture of connective tissue They are found in all sorts of tissues and organs, mostly on or below the surface of the body. In the subcutaneous tissue, when mixed with much connective tissue, they are liable, after baving remained unchanged for many years, to undergo sarcomatous degeneration Therefore, and because of their tendency to rapid growth in every direction, with increasing deformity and possible danger from hemorrhage, the early removal of all those which do not exhibit from the beginning a tendency to fade and finally disappear is indicated The methods followed to obtain that end are very numerous. Vaccination over a nærus will generally destroy it, but may do so but partially, and will leave a bad scar. Plasters of tartar emetic and of Vienna poste cannot be controlled to such an extent as to destroy the growth only. Injections of perchloride or subsulphate

of iron are known to have given rise to extensive thrombosis, gangrene, and death; injections of alcohol have been tried, but have not, I think, reached farther than the ear of the medical public. Corrosive sublimate in collection (1 to 8) is an excellent caustic where the nævus is not extensive, particularly on the head; it rarely requires more than a single application. Furning nitric acid is perbags the best of all local applications; the pain is but temporary, and the effect circumscribed and fairly thorough. But it ought to be used for superficial nevi only, and even then requires repetition in a number of instances. Excision is a good method if the operation can be performed in a short time and all the morbid parts can safely be removed without loss of too much blood. The ligation of angiomatous tumors is indicated where they can be entirely grasped either without or with the aid of needles run through their base; but time is required for them to fall off finally, and the wound demands careful and persistent antiseptic treatment until the danger from local infection has passed and a smooth sear has been perfected. Electrolyas has been praised very highly, particularly in the treatment of the extensive wine-marks. Still, personally, I never saw a satisfactory result in these cases. There remained always speckled, whitish scars of small size alternating with the original discoloration,-a result which I should not claim as an improvement upon the original condition. The actual camery is the most satisfactory of all our remolies; very few will at present use it in any other shape than that of the galvano- or the thermo-cautery. The heat should not be excessive! white heat destroys blood-vessels too rapidly to permit of simultaneous congulation of the blood, and produces hemorrhages. Dull-red heat will accomplish a cure. A momentary application suffices for a superficial nevus; its action can always be metrolled and strictly localized, and the formation of the scurf secures against surface infection. Nor are large angiomata inaccessible to it. When these are to be destroyed, it is best not to attempt too much at first. It is unnecessary to destroy everything; long after the direct effect has passed away, coagulation in the blood-vessels and slowly progressing excatrigation result in the gradual lessening of the swelling When the tumor ceases to diminish in size, the operation is repeated, sometimes after many weeks or even months. The cautery is then introduced into the very spot at which the previous application was made. In this way the cicatrix remains localized. As a general rule, a cicatrix following the application of the actual cautery is smooth and becomes more so and less perceptible from year to wear.

L. The Lymph-Fessels

Lymphongions is the dilatation of lymph-ressels, localized or multiple, with or without proliferation, extending from the walls of the lymph-ressels. Careless operation with the knife may lead to lymphorefices; I removed several with the actual camery. When in the skin, multiple, and contacted with hypertrophy and cofema of the cutts and subcutaneous tissue, either localized (neck, shoulder, dorsom, extremities) or diffuse, it is called *elaphantiana*. It may be removed when not so extensive as even to preclude, after removal, skin-grafting to replace the defect.

Of chyloria (lymphorrhera into the urinary organs), tuch as is frequent in tropical regions under the influence of filaria sanguins, and observed by Bouchut in an hysterical girl of fifteen (no cause known), I have seen one case in a child of eleven years. Kamienski had a case of chylous ascites in a huby of five weeks. Paracentesis appeared to be harmful, recovery was spontaneous (Juhrh. J. Kind., vol. ali.).

Cythe tymphogonus (hygroma, on the neck and in the axilla) is unifocular or multifocular, alightly movable, fluctuating, and not compressible, because there is no longer any open communication with the rest of the lymph-system. On the neck it may be mistaken for the hygroma resulting from a partially patent and endwise obstructed branchial arch. Total extingation is the perferable operation if it can be done. Poneture and subsequent irritation by injection of alcohol, or Lugol's solution, or diluted earbolic acid (from three to five per cent.) may require repetition in multimedicar cases. That is why incision of the cavities and subsequent iodoform drainage should be preferred. Occasional complication with a mulignant tumor impairs the prognosis

XI

Diseases of the Skin

Burns. Burns of the first degree rarely require more than cooling applications and rest, both general and local, water, lead wash of different strengths, oil, and cotton. Persistent cold applications are not tolerated. When large histors have been formed, the epidermis should be removed and the sore surface irrigated with an antiseptic solution or an aseptic sterilized saline solution (6 to 1000) and thoroughly dusted with bismuth subcarbonate or dermand. An aseptic dressing then applied may remain eight or ten days; after that time the sores will generally be found healed. Individual cases and opportunities may require different methods. The time-honored application of equal parts of lime-water and oleum lini, to which a twentieth of a per cent, of thymol may be added, is still much favored. The hum should then be thickly covered with aseptic gauge. After this application is removed, a fine powder of bismuth subcarbonate should be spread over the wound and the whole covered with gauze again, or an ointment containing bismuth, or bismuth and bornese acid, or bismuth and zine may be employed. To thoroughly guard against infection, the washing of the wound with a three-per-cent, solution of carbolic acid, or of salicylic acid, or of boracic seid (not so painful as the other two) must precede the application of a gauge thoroughly covered with bismuth subgullate finely powdered, or with a mixture of bismuth and starch, or the same with the addition of from one to two per cent, of salicylic acid, Such an application may remain undisturbed for weeks. Orthoform powder is southing and fairly antiseptic. Extensive burns do well in the permanent warm bath. Should large defects result, transplantation may be practised afterwards; if contractures, extension must be employed in time and apparatuses used for a sufficient period.

The younger the patients the more liable are they to suffer from burns, though apparently mild. Reflex symptoms of a nervous character are not quite so bad as the transformation of hamoglobin into methemoglobin, or the toxic swelling of lymphatic glands, both or either of which conditions are held responsible for the excessive dangerousness of extensive hums. Much reaction may set in after a day, with high fever and convolutions. Therefore the thermometer ought to be consulted soon after the accident and the symptoms prevented or treated. Distributa is not uncommon, even after moderare burns, and requires opium and the regulation of diet; collapse demands stimulants, either internal or subcutaneous; and sleeplessness appropriate narcotics.

Burns are more frequent than are the effects of cold, though there are patients who suffer from the latter annually. Common frost-blugs are frequent, it is true, and annoying, but rarely of great importance. The rubbing of red, itching, and swollen parts with snow (or with petroleum) is quite effective in mild cases. The itching is often relieved by a mild tineture of iodine or by the application of a (from three to ten per cent.) solution of silver nitrate or of calcium chloride in water (1 to 2 or 200), also by camphor in lanolin (1 to 10). The popular remedies of tallow and whiskey or, better still, the application of carpenter's glue to frost-bites bring relief. This may also be obtained by surrounding the inflamed swelling by a protecting (com) plaster. Vesicles on the toes and heels, filled with blood and resulting in ulcerations, require the latter treatment, together with bismuch subgallate, naphtalin, orthoform, or cauterization with silver nitrate entil granulations spring up, or an ointment of balsam of Pern with or without zinc oxide, or hismath, or applications of a threeper-cent, solution of aluminum acetate, or a fuchsin one, landin eighty, vaseline twenty ointment. Gangrene of the skin or of whole extremities is, fortunately, rare. When it occurs it demands entional surgical treatment.

Subsideneous emphysema may be the result of fracture of ribs or stermin, as in the adult. Most of the cases I have som occurred during inferior tracheotomy when the incision was too long, or during whosping-cough; a few in pulmonary abscess with adhering pleura. Actual treatment was never required, as absorption takes place within one or two weeks.

Erytheste is not with at every age of infancy and childhood, and depends on a number of causes. The treatment is, therefore, partly symptomatic, partly causal. In the newly-born, from the establishment of an unprecedented cutaneous circulation and the discontinuation of the intra-uterine aumiotic pressure, the skin becomes red, changes to yellow (alterations of liamatin), is subject to extensive perling, and, finally, obtains its normal pink color under ordinary circumstances. The erythema, however, is not always uniform: now and then it bears a resemblance to measles, and is attended by lever, but not by catarrh. As a rule, it demands no treatment except preventive. The bath must not be lot, the temperature of the room not

almormally high, the bedding not hot and oppressive. Vaseline, cold cream, or lanolin is useful where the redness and the tendency to perling are very marked.

In the following months erythema is a common symptom when the babies are exposed to pressure or friction by clothing, to the beat of the summer, of stoves, bedding, or bathing, to irritation by urine, or to the septicemic after-effects of infectious fevers, such as measles, angina, diphtheria, typhoid, or influenza, or after drugs like saiol. In some of these cases desquamation is observed; it is the more readily a cause of mistaken diagnosis the longer it lasts and the greater its extent. Children of three or lose years, when afficied with diarrhese and consecutive cachexia, are subject to a papular erythema which is mostly confined to the gluteal regions and the extremities. Finally, thin and feeble children exhibit frequently a general redness, sometimes mostled, which lasts as long as does the sluggish circulation depending on their general condition.

The indications for treatment in all of these varieties are furnished by the causes. Irritation of the surface should be avoided; the patient must not be exposed to absormal temperatures, either of airor water, or to errors in diet; diarrhera and emaciation must be arrested, and vaseline and fats used according to necessities. In many cases a full supply of drinking-water, which is too frequently withheld from the very young, corrects the evil by stimulating cutaneous circulation and the tendency to perspiration, which is almost absent during the first month and very scanty in the second and third.

Constipated and dyspeptic children are very apt to suffer from erythema as the result of intestinal autoinfection, sometimes to such an extent that the diagnosis between it and scartatina may become doubtful. The difficulty grows in those cases in which the intestinal crythema is attended by the corresponding intestinal fever, an occurrence not at all uncommon. Constipation may be congenital or acquired, and may lead to the same result. The diagnosis is not always easy for other reasons,-viz., the apparent normality of the stomach, which may be found dilated, the absence of diarrhosa, and the actual or alleged absence of flamlency. This erythema is not incommen; it may last hours or many days, or may alternate with acute attacks of urticaria. The latter is, therefore, not always gastric or neurotic, either in its acute or chronic form, but may be toxic, and it thus shares the etiology of many cases of acue and some of senile pruritus. When occurring in the face exclusively, I have seen it mistaken for erysipelas.

This variety of grythema is sometimes seen mostly on the hands and feet, is symmetrical, and now and then, like urticaria, has vesicles or bulke (similar to herpes iris). When it accompanies intestinal natousfection, it is usually followed by indicamuria, though perhaps not so regularly as in adults with intestinal disorders, and othersulphuric acids in the urine, which is liable to be very scanty and of high specific gravity. When in such cases it is universal or nearly so, that condition of the urine may now and firen be utilized for the differential diagnosis from scartatina, measles, or rubella. Skatol and indol are found in the faces. In most cases a surgative (preferably calemed) will bring speedy relief, but actual and lasting aid will only come from prolonged disinfection of the intestinal tract by maphtalin, salol, resorcin, oil of peppermint, small doses of calomel or hedrargerum bichloride, from large enemata containing a twentieth of one per cent of thymol, or from such as consut of aromatic infusions (mint, catnip, chamomile) exclusively, from occasional purgatives, and from the regulation of the diet, which must be such as not to cause fermentation and putrefaction. In the employment of the sulphires (of sodium and magnesium) I have been rather disappointed. The use of menthol is not to be recommended; it can be swallowed in capsules only, and to atone for its local irritation it has no eminent virtues. As to diet, proteids, except milk, should be avoided. faringcosus foods (cereals) are preferable. Orango-price. is pleasant and includ. Hydrochloric acid in water () to 1500 or 2000) as a regular beverage for weeks.

Erythron norforem (p. 258) may be discussed in connection with this subject. It is probably an angioneurosis of infectious origin (rheumatism, etc.), complicated frequently with pleuritis and endocardinis, very much like erythron conditions multiplex, and consists of large nodes, whose redness turns yellow in the course of the normal alterations of humatin; it is mostly seen on the legs, but also along a number of tendons from the occipit downward. It requires rest. When it is the result of rheumatism, sodium salicylate as indicated, when it depends on malaria (Moncoevo), quintue. A six-per-cent, solution of silver nitrate has been recommended for external application. I have used with benefit, I believe, immediates of olemn gaultherize, of potassium isolide in glycerin (1 to 2 or 4), and of potassium isolide and lanolin ointments.

Erythems complicated with loss of epidermis, either without apparent cause se through irritation by urine or faces, or by friction of the adjoining surfaces of the nates, thighs, availar, and the folds of the neck, together with secretion, and even crusts, is called

interreigo. It is mainly noticed in fat, flabby, and rhachitical babies. is painful and annitying, and may prove dangerous by becoming gangrenous or by inviting the invasion of ervapelas or of dightheria. Therefore, its treatment and cure are imperative. The dispers must be soft, not planed during sleep, and frequently changed! the bables must be kept scrupulously clean and bothed at least once a day. A seven-per-mille solution of table salt is more pleasant than water alone. Diarrizon should be relieved by dieting, internal medication, and rectal injectious. Astringent solutions (zinc sulphate, aluminum acetate, tannin) would be beneficial but for the difficulty of making regular applications; continents containing misc oxide, bismuth, tannin, or lead are preferable. Fine powders of hismath subcarbonate, of talcum, of amylum, or mixtures of 100 of them, with or without the addition of one or two per cent, of salicylic acid, will not satisfactorily. The popular hycopodium powder is not to be recommended By reason of its gining together it proves smitant, like all foreign bodies.

Among the circumscribed inflammations of the skin met with in children, mostly of advanced age, are some lichen, and provige-Acne is dependent on an interrupted action of the selection follorles. They begin their rapid development about the middle of intranterine life, and are large and numerous at birth, particularly over the nose, ears, evebrows, and around the mouth. When obstructed, they exhibit in the infant no black-heads like the comedones of the adolescent or adult, but are white. Normally, they secrete much tallow, which gives the foreheads of many habies their shining, glossy appearance. When this tallow accumulates and gets dry, and morewith the scales of the endermis and foreign material, such as dust etc., it forms arborrhou of any shade of color between whitish and black, which is more difficult to remove because of the conservative seperstition of the mother than because of its own obstinger. Its importance and its dangers are quite local; it interferes with the growth of hair and predisposes to local trritation of the scalp; it ought to be removed by oil, fat, soup, hot water, and brush, and the subjacent hyperemia relieved by an astringent continent. No stimuating diet. Ichthyol in solutions or in ointments has been frequently recommended, as in all irritations and inflammations of the skin-

When acne has formed (in older children) the comedones ought to be squeezed out. For this purpose an old-fashioned watch-key with broad edges will prove as serviceable as most of the mechanical devices of instrument-makers, almost as much so as Piffard's handy little instrument. Frequent hot washing with green sup, or spirit of soap, followed by ice-cold trashing, I have found very useful; besides, the skin should be trashed four times a day with a solution of corrosive sublimate in water, or in alcohol and water (1 to 20 to 2000 or 1 to 20 to 1000).

Washing with vinegar dissolves the epidermis cells and thus aids in disintegrating and loosening the obnoxious material. Various mixtures of emplastrum and imputation plumbi may be employed. After a thorough cleansing with soap, equal parts of precipitated sulphur, glycerin, and alcohol (to be preserved in a well-stoppered jar) are applied in the evening and washed off in the morning; or beta-napittel to parts, precipitated sulphur 50 parts, lanelin or vaseline 25 parts, and green soap 23 parts are applied and removed by washing after fifteen or twenty minutes, after which the skin is covered with talcum or starch. Only in the very worst forms of acne (fortunately, rare in children) must scarifications be resorted to

Lichen is mostly found in its mildest form; straphalas of pinbead size, slightly excavated on top, around a hair. It is not particularly resistant, but is liable to return. Lichen scrafularcensu, however, the result of living—not virulent—tubercle bacilli that give rise to no other symptoms, is upt to be obstinate. It is mostly met with in older children, is of a yellowish or red color, and forms a circle around a hair. It does not itch very much, but by reason of its duration and appearance is quite amoying. Locally, warm bathing and frequent ablations with vinegar and water (a to 3 or 6) will act well. Antipyrin in a nightly dose will relieve itching whenever troublesome, and by its sudorific effect will contribute to the disintegration of opidermic accumulations. The general treatment of scrofula is required on account of its causal indication. Lichen acuminatar and planus consist of circular nodules congregated round a pigmented spot, the first in rows, the second flat. Both are rare in children

Provigo is found, of pin-head size and pink color, on the extensor side of extremities and in the gluteal region and on the abdomen. In its neighborhood the Ismph-hodies swell, and chronic pigmentations are frequent. The itching is terrible, intolerable, exhausting, and may prove fatal. Twice I saw it complicated with or depending on early diabetes; in both cases it terminated only with the fatal cause. Insections of glycerin or fat and protracted warm hathing in water or alkaline mater should be resorted to. The baths ought to be continued for hours, and may be allowed to last half a day Vinegar will dissolve the epidermis. Pilocarpine will do well in subcutaneous injections large enough to produce perspiration. As much and as long as permissible it may be combined with antipyrin; and

if subcutaneous injections be found impossible, it ought to be administered internally. Tar, sulphur, and groen scap have been found very useful, when continued for from four to six weeks in alternation with warm baths. Wilkinson's outment contains all of them (for sulphuris of rusci, an to parts; supon, virid, vaselin, an 20 parts). Kaposi recommends supfited eintment (5 to 100). The addition of five per cent, of menthod to every ointment used will prove helpful. But it should not be forgotten that the prognosis becomes more serious with every mouth or year of the duration of prurigo, and that general and preventive treatment demand urgent consideration. Most patients are stricken in their second year; thus an hereditary influence is to be suspected in numy. Often the parents are tubercular. The urine should be examined for plucose.

Both prurigo and lichen (also acre in the severe form—rosacca of adults—) will often be benefited by ichthyol (thiol has been recommended for the same purpose, locally) in from five- to twenty-percent ointments. It may also be given internally, when there are hard and irritating infiltrations, in daily doses of from five to twelve grains (0.3 to 0.8). Other internal medication is useless, except arsenic, an occasional purgative, and now and then a sedative (monobromated ramphor at bedtime in doses of from two to six grains = 0.125 to 0.4); strict avoidance of stimulants and moderate use only of meat are the main dietetic rules.

Furunculonis in the very young does not often exhibit the same character as in adults. Both the sebaceous follicles and the perspiratory glands being rather patent, there are rarely such large and hard indurations. It is often complicated with acne, or follows eczema, and may complicate scabies. It is frequently found in cachectic infants and children and after protracted diarrhosa, generally in the form of multiple and cold absersses; sometimes in connection with tuberculosis and glucosuria. These abscesses are liable to lead to extensive suppurations of the connective tissue. The skin must be kept disinfected either by blue outment or by corrosive sublimate in water (1 to 2000 or 5000). Abscesses—no matter how many-must be incised and disinfected with sublimate solution, or sodoform, or treated with the sharp spoon, or filled with antiseptic games, according to circumstances and to sizes. Now and then these abscesses are found near the matrix of the nails, not multiple as in syphilis, but localized, and are liable to destroy the matrix unless incised and disinfected in time. Secondary lymphatic swellings round the neck will, when benign, disappear after a while. If not, they are probably tubercular, and of persistent, without a tendency to get smaller, ought to be enucleated. A preventive measure is the covering up of incipient furuncles with some indifferent plaster (soap, beliadoma; no turpentine) to avoid the friction of the clothing. Arsenic in small doses, but persistently given, has a favorable effect. G. Langmann speaks highly of the preventive and healing local effect of the galvanic current.

One of the most common forms of dermatitis in the young is rearms in its different forms; the dry, not scal-dorning, and very itchy; the small vesicular and jugular, with but slight desquamation or the formation of thin scale; the purulent variety, imperigo, with moderate crusts; finally, the rapidly growing and pointed ecologic and rupia. For, indeed, all of them are but varieties of the same process. It may be microbic in isolated cases, but certainly is not a microbic disease generally. It may be complicated, however, with a parasitic ailment such as scables. A disposition is caused by the tendency to congestive, catarrial, or inflammatory disorder such as is understood by "scrofula," not by tuberculosis; also by rhachitis, chronic indigestion, and anzenia; also by incidental fevers, -for instance, that of execusia; indeed, it is not uncommon to date the first appearance of eczema back to the effect of vaccination. These occasional or constitutional partial causes of eczema must be considered as regards general and constitutional treatment. These are the cases apt to be benefited first by appropriate diet, then by the protracted use of arsenic, the hypophosphites, cod-liver oil, and iron. Still, it is important never to be tempted to begin such a treatment in an acute attack of eczenia, which is more apt to be benefited by a few moderate doses of quinine and purgatives.

Acute econics is liable to run its course with a great deal of swelling and irritation, resembling in these respects erysipelas. It bears absolutely no water, and in the beginning no ointments. Powders of amylum, or of bismuth subcarbonate, or rine oxide, or aristol, pure or in different proportions, with or without the addition of one or three per cent. of salicylic acid, prove more efficient. After a while the same constituents may be used as ointments. No large surface of a nursling's skin should be covered with ointments at the same time. Still, an occasional death during the treatment of eczenta should not be attributed to it or its treatment, but to the "lymphatic condition" and circumstances connected with it, and to other causes.

Most of the cases presented for treatment are chronic, either in the moist, or crusty, or squamous form. Many of them are itching, and are apt to lead to persistent infiltration of the skin, even amounting to elephantiasis. In many of them the original local causes are still persistent and can and must be relieved or removed. All sorts of local irritation are found. Seborrhera, uncleunliness, secretions of the mose, ear, and eye which are permitted to remain and irritate the neighborhood, the oral secretion from whatever cause excorating the checks and chin, the septic piercing of the ear, the presence of vermin on the skin, are all frequent causes of occurra, the predisposition to which is established on certain parts of the body where eczema is most common (head and face) by the large size of the carotids and the physiological congestion and rapid development of the head and all its organs. By mistaking this connection, even the physiological protrusion of the teeth his been charged with producing eczema. Indeed, everything causing sluggish carollation and congestion to the surface—the constipation, for instance, of fat babies, but bathing, the influence of solar and store heat—may have the same result.

The effect of protracted ecerma on the head is liable to be grave by interfering with the growth of the hair; by causing and extending catarrh of the ear and nose, or blepharitis, conjunctivitis, or keratitis; by producing open sores and thus facilitating the invasion of styripelas and possibly of tubercle germs; by irritating and tunelying the minurous lymph-bodies of the neighborhood with the complication of hyperplasia or inherenlosis. Thus, the indications for treatment should be considered urgent in every case of ecoma; the moner it is suppressed the smaller is the number of complicating dangers which are direct outgrowths of what appears to be, in most cases, a merely local affection.

Local as well as general hygienic and constitutional treatmentmostly preventive-is required. The body of the infant must be kept clean, but the local eczema should not be touched by water more than is absolutely necessary: the reaction after the bath is hable to bring out a new eraption. If this be on the head, the lair should be cropped close. The nails must be kept short so as to prevent scratching as much as possible, the hands associates tied up, or the face covered. Remove thin or thick scabs by warm water, soap and water, warm fomentations (not on the head), oil, fat, liquor potassii oil or in cod-liver oil (1 to 8 or 12). Use the comb when the scale are beginning to loosen. Below them the surface is hypersenic or coring; the secretion must be wiped off and stopped as soon as possible. Solutions of astringents are neither so convenient nor so effective as olutments. The official zinc outment will suffice in many cases, if fresh, Vaseline by itself is irritating. Bismuth subcarbonate 5 parts, with ungr. zinci and vaselin., an 20 parts, is a good combination. Such applications may be made from two to five times

a day. Hebra's ointment is thickly spread on linea and the surface covered with it; layers of it may be worn for days or weeks. There is no harm in the extensive use of lead; I never saw or heard of a case of direct cutaneous absorption which stood criticism, but I have seen lead poisoning in a boy who scraped the lead continent from his cheeks and ate it for many weeks in succession. The formula now and then published in the journals are very numerous; every thoughtful practitioner will make or combine his own from blemth, zinc, lead, or tamin. In addition to these, I mention for investments cases and the scaly form tur (tar, alcohol, and green soan in equal quantities, or ol. cadimum i part, ol. oliv. i part, lanolin. to parts). hydrargyrum ammoniatum (either the official centment (too strong) or a modified formula, such as zine oxide a part, ammonium hydrate. I part, ol. amygdal, dulc, r part, fat 10 parts), and, finally, silver nitrate. It is mainly in the most obstinate chronic cases of eczeniathe crustaceous or squanous variety-that a large surface will heal under the influence of a solution of from three to ten or forty per centof silver nitrate, thoroughly applied. A good ointment is made of hydrargyrum hichloride 1 to 200 or 300 of lanolin, which may be gently rabbed in once or twice a day.

Tar has one grave inconvenience. On skins which absorb rapidly it may prove dangerous to the kidneys. Nausea, vomiting, diarrhera, headaches, vertigo, and a smoky or even black urine, occasionally with more than mere albuminuria, may be observed. The same, to a greater degree, must be said of carbolic acid, which may be added to continents (2 or 3 to too) to relieve ticking. It requires watching. Where it cannot be used, occaine (2 or 5 to too) or lead, zine, or bismuth continent may take its place. Where the surface healing is slow, the proliferation of tissue can be accelerated by balsam of Peru (1 to to) ointment. Bulkley recommends, even in acute occurs, alumnol, from one to five per cent, in solution, ten to twenty per cent in continents.

Erzema sebest-haricum (Unna) is a parasitic (microbic) affection.

Zinc ointment should be mixed with four or six per cent. of resorcin;
or a solution of resorcin (from five to ten per cent.) in alcohol and
glycerin, to be used twice a day.

Perophigus is more frequently observed in the newly-born (mostly between the fourth and eighth days; the syphilitic form of the soles and polms even earlier) and very young than in older children, mostly on the face and trunk, with a pale or hyperamic basis, running its course when benign and sporadic, inclusive of the drying of scales, in from six to twelve days. It is seldem chronic, and mostly

to mild that no scales remain, except when it is complicated with diphtheria or general cachecia. In such cases the bulbs may be hemorriugic, or even gangrenous. The series (albuminous and mostly sentral or alkaline) contained in the bulls, which spring up, with no or a very thin aureola, at some distance from one another, becomes turbid after some days. There is rarely any fever. New crops may start up. Strelitz and Almquist gave themselves pemphigus through transferred cocci. Riehl found in a single case a fungus resembling tyry much the trichophyton tonseruns. It is often found on chileren in institutions, and will also spread to surses or to suembers of the same family; it seems, therefore, to be comagious, and may be disseminated through eareless midwives. In such cases staphylococcus progenes aurens was found. Isolated cases are the result of hot bathing and bedding. Thus it seems that this disseminated pempligus may be either the result of microbes (staphylococci, like those of impetigo) or of mere estaneous irritation, particularly at the time when the surface is most vulnerable,-that is, in the newlyhorn. Pemphigus exfoliatious, or dermotitis exfoliation, is a very serious form which is apt to terminate fatally in one-half of the cases. According to Ritter, it begins at the mouth on the first or the fourth day of life and extends all over the body, with an angry redness, phlegmons, and gangrene. It was observed in hot seasons, after hot hathing, in sepsis. Righl discovered a fungus with long mycelium. No scales form, but relapses take place contiguous to the first starting-point. Dermatol, aristol, bommth subcarbonate, powdered or in a five- or fifteen-per-cent, landin ointment, with soft covering, warmth to the feet, atimulants, and no hatling, is the appropriate treatment. The treatment is suggested by the causes thus far enumerated. Beware of heat and of contagion. Cleanliness and disinfection are required as preventive and curative measures. Astringent ointments or hismath powders are demanded locally, particularly where the epidermis has been torn off; general roborant treatment is required for pury and eachertic children, and antipyreties if (in exceptional cases) the temperature rise to an unbearable degree; for even delirinm has been observed in older children. In most cases powders of bismuth, taleum, anythm, zinc oxide, etc., render good service: in ulcerous cases orthoform, or lodoform once or twice a day, or a solution of silver nitrate (1 to 100 or 1000), or fuchsin dintment (p. 472).

Neuropathic affections of the skin are sometimes congenital; while not always connected with cerebral defects resulting in paralysis or epilepsy, like the papillomata described by Neumann (fissured

warts following the course of a nerve and covering the whole side of a body), still, they are serious enough, and sometimes not influenced by treatment. The congenital disposition to the formation of resides. is in later life often combined with other neuropathic symptoms. A febric bullion has been described both in children and adults. It is reported to be contagious, to have constitutional symptoms, and to run a course like acute exauthemata. It should not be forpotten. first, that diagnoses may be mistaken, that the symptoms of disorders of circulation and of innervation may be very variable, and that on principle it should always be considered risky to coin different names for slight varieties. The pemphigus neuroticus chronicus of the mouth described by me (Trans. Ass. Am. Phys., 1894) cannot be mistaken. Common wasts are probably, in many instances, trophic disorders of a neurotic character; their sudden appearance in great numbers and their sometimes unexpected disappearance seem to prove it. While furning nitric acid is a fair local application, the internal use of arsenic is often of much advantage. This is certainly the case in what has been noticed first by Hebra as "verruce plante juveniles," and carefully elescribed by Thin. These warts are met with in children and adolescents on the face and back of the hands and fingers; they are yellowish or reddish brown, of the size of a pen or less, flat with a central depression, and may have frequently been mistaken for lichen ruber planus

A neuropathic ordense has often been described, and is easily overlooked when moderate. In a case described by Widowitz it occurred
after exposure to cold, with extensive tumefaction, livid edges, and
without any complication on the part of the heart or kidneys. A
neurotic symmet has been reported by Tordens, and by him connected
with "dentition;" citaligo in a boy of six years by Wladimiroff. The
eyelids, lips, tongue, plustynx, larynx, the orbit, (recurrent exophfhelmor), the joints (hydrops enticulorum intermitteus), the kidneys
(polyuria), the mucous membrane of the intestine (nervous diserhors) and of the bronchi (nervous aithms) may thus be affected.
Exposure and winter weather are among the causes and suggest
preventive treatment. This orgio-sensotic ordens and articovis should
be considered as the result of similar causes.

Urticaria should be treated locally and for its causes (irritation of the skin by scratching, vaccination, epizon or insects, digestive discreters, medicines like quinine, santonin, balsamics, foods like oysters, strauberries, or fish, uramia, diabetes, etc.). Locally, washing with carbonic acid waters (siphons), with one- or two-percent, carbolic arid solutions, dilutions of chloroform and spirit of

camphor, corrosive sublimate in three hundred parts or more of rinegar and water, one-per-cent, solutions of menthol, and cold cream or vaseline should be used. Internally, stomachies, purgatives, and ichthyol will often do good. The latter may be given a long time with or without fiquor arsentis potassu.

Urticaria pigneratora was described first by Nettleship in 1869. It originates soon after birth, and lasts, with intervals and relapses, until the fifth year of life or longer. Red papule, which soon flatten out and become pigmentous, on the erythematous surface, on the chest, back, abdomen, and extremities, rarely the face, still less on the palm of the hand or the sole of the foot. Unm found rarefied connective tissue with columnar cells. The usual external treatment of common urticaria is not successful. The internal treatment with arsenic thould not be neglected. With ductiess gland administration I have no experience.

Symmetrical entineous hemorrhage connected with cerebral flisorder has been reported by Epstein; crythormalalgia in a child, by Baginsky; symmetrical entaneous gaugeron (Raymond) of feet, nose, and ears, with homoglobinuria, in a boy of three years, by Abercrombie; in children of seven, eleven, and thirteen years, belonging to the same family, by Braman. Several of my cases were quite superficial, and healed readily; others terminated in loss of limbs or life. The disposition afforded by rhachitis, assentia, or leucocytosis is not always demonstrable. They follow acute or chronic constitutional or infectious fevers, measles, pneumonia, typhoid, scarlatina, diphtheria; even whooping-cough, dysentery, etc., and anything that will so depress circulation as to result in peripheric thrombosis. The treatment, besides preventive measures, is locally antiseptic and stimulant.

Science of the second served in the first year of life (Barth). I saw it in a girl of three, a girl of six, a loy of ten, and one of thirteen years. It begins with small or larger, generally symmetrical, circumscribed, mostly longuadinal, discolored hyperplasias, which (usually) after a long time lead to atrophy, shrinking, muscular immobility, and contractures. There is little or no perspiration, and sensation is frequently impaired. I never saw a case in a child or an adult that did not give me the impression of a neurotic (local or more frequently central) origin, and of its being guided by the course of a nerve. The diffuse form, with normal or glossy skin and (generally) disturbed sensation, which extends over the face, or a whole limb, or the whole hody, has not been found in children as yet, but

in adult females only. Mainly in the beginning, mercurial treatment, bichloride or blue cintinent, in long-continued small doses, did some good. Salol (salicylic acid) has larely been recommended by A. Philippson, who reports two recoveries (adults) under doses of from two to three grammes (thirty to forty-five grains) daily. L. Weber improved a case by giving thyroid (Med. Monaturek, October, 1897). De Renzi recommends the injection of a few minims of a ten- or fifteen-per-cent, solution of thiosinamin, Blooq electro-puncture.

Herges (group eruption of small vesicles on a hyperamic anneals) is mostly seen in fevers, such as pneumonia, meningitis, influenza, also in dyspepsia. Powdering with boracic acid, demantal, zinc stearate, or the application of lead wash or a one-per-cent solution of alum in water. Herges notice is mostly found on the lips (chin), in the month, and over one or more intercostal nerves, also over the masal, frontal, sciatic: never over motory fibres when alone; seldom in the severe neuralgias met with in the adult. The irritation is peripheric almost exclusively, seldom in the gauglia, very rarely in the cord (bilateral chorea). In the latter case the spinal (myelo-) meningitis requires calonel and ergot, also salines and digitalis; rarely the thermo-cautery. The usual cases require the local treatment of herges, a daily dose of quinine with antipyrin, and repeated doses of the latter or of aspirin.

Scabies is apt to become chronic in children because it is often mistaken for or complicated with the various forms of eccena and "prickly heat." Errors may readily take place, because it is not preeminently the fingers which are affected, but also the face, the gimeal region, the abdomen, and the joints. These localities constitute a difference from prurigo, in which the extensor sides of the extremities are principally affected. The skin must be thoroughly cleaned with soap every morning, after baloam of Peru, or balsam of Peru it parts, alcohol to parts, or balsom of Peru and vaseline, in equal parts, have been copiously applied the evening before. A few such applications will suffice, but they stain the linen. The inguentum sulchuris of the Pharmacopogia is too irritating to be applied to the skin of children, but may be mitigated by the addition of fat, styrax liquidus, and olive oil, in equal parts; creolin (from 5 to 10 parts in too parts of olive oil) or naphtol with fat (5 to 15 or 100) will also render good service. The clothing must be thoroughly washed in hot scap and water or disinfected with sulphur. Both naphtol and styrax may irritate the kidneys, so that they are contraindicated in children with renal affections. In them, Williamon's ointment (of rusci, flor, sulph., às 20 parts; supon, virid, ruselin., às 40 parts; cret, alb., 10 parts) is advisable.

Imperity contagious has thinner vesteles than pemphigus, no fever, and no inflammatory basis. It is found on the incovered parts of the body, face, hands, and feet; the vesteles are small or large and spread rapidly, and relapses take place. Serious results have not been noticed; still, a case of nephritis is reported as a suspels in a girl of twelve years. It is met with in schools and after whole-sale vaccinations, through infection by vaccine lymph. Lassar found the staphylococcus aureus. As many as a thousand cases have been observed in a single epidemic. The treatment must be preventive, if opportunity be given; a school in which the disease is found ought to be closed temporarily and disinfected. The local (and general) treatment is that of a mild exoma.

Forus is, through its achorion Schoenleinii; eminently contagious from child to child and from animal (rabbit, cat, dog) to child, is communicated through beds, caps, and finger-nails, and is not confined to the head. A mild treatment may first be tried. Green soup and warm fomentations will succeed in removing the hard masses, and solutions of corrosive sublimate (a to too or 300) and ointments of naphtol (five per cent.) or pyrogallic acid (ten per cent.) may prove beneficial. Or a ten- (or less) per-cent, ointment of chrysarohin may be tried (according to Wolff) daily for six weeks, alternating it with a corrosive sublimate ointment (1 to 100). After that time, if the treatment have been tolerated, the application should be made every other day, and later once a week. The unguestim hydrargyri ammoniati will do the rest. I rarely saw a case improved without epilation, after a thorough removal of the yellow crusts by means of green soap and fomentations. Epilation can be done by pincers or by the old method of the pitch-cap, which is applied after the hair has been cut to one-third or one-half inch in length. Biedert modifies the old plan by melting two hundred and fifty parts of white puch and four of tallow. The mixture is then spread over a cloth from six to eight square inches in size, which is Instened on the hair stumps with a hot iron and allowed to remain an hour before it is pulled off. This procedure is repeated every six or eight days until the cranimn is entirely bald and smooth. The pain can be overcome and the cruelty of the necessary process moderated by the use of an anxithetic. Very obstirate deposits must be scraped out.

Herpes toneurane (from trichophyton tonsurans, a parasite very similar to achorion, common among domestic animals; circular vesicles, enlarging) requires a treatment similar to that of favus, in-

choling epilation. Before resorting to it, cintments of sulphur, telathyol, salicylic acid, or chrysarobin may be tried. Corrosine subliment (1 to 100) in solution and naphtol cintment are very efficacious.

Mollaceum contegioram (light nodes from which lobulated whirish masses containing brilliant oval fiedies, perhaps protozox, can be squeezed out, mostly on the uncovered parts of the body) is very contagious and is met with epidemically. Communication from child to child or from buby to nurse must be guarded against, the morbid growths removed with the slump spoon and the wounds treated antisoptically (best with carbolic acid), and finally, if required, with balsam of Peru or ointments containing it.

Lupus is in some of its forms (exfoliations, inherouss, explorans, serpiginosus) not accessible to anything but external treatment. Still, the treatment of the patient, who, as a rule, shows more symptoms of scrofula than of inherenlosis, is not excluded. Zinc chloride has been mixed with two or three parts of starch and made into a paste with water. Its application is very painful and its effect slow. So are Larnedongue's repeated injections of a ten-per-cent, solution of rine chloride in water; still more so Milton's indefinite and persistent use of carbolic acid and of a twelve-per-cent, solution of potassium hypermanganate (joined to the internal administration of arsenic, potassium iodide, and mercury). Another method consists in the repeated application of saturated solutions of lactic acid; still another is the use of the sharp spoon, and then for three or five days in succession that of a ten-per-cent, mixture of pyrogallic acid. Wherever the affected part is not too large, and in a convenient locality, excision ought to be made and the wound closed; should it be too large for that, transplantation may be performed afterwards. At all events, the destruction of the morbid part, wherever aimed at, is most easily accomplished by the actual thermo- or galvano-cautery. Tuberculinhas failed here as in other cases of tubercular disease. A paste compased of arsenous acid 1 part, hydrarg, sulph, rule, 3 parts, vaseline 15 jurns (or another menstruum), applied thilly for several days in succession, has a deserved reputation for destroying the murbid masses. Both the Finsen light and the X-ray treatment are still in their experimental stage.

Lupus erythemotoms has its localized inflammatory cell-infiltrations near the surface, particularly in its most recent disseminations. That is why it may be most amenable to treatment. I. Schutz treated nine cases with two daily applications of a mixture of a parts of Fourier's solution in from 20 to 30 of distilled water. When after four or six days the surface became irritated, a mild powder was substituted for a few days, and the treatment resumed after four or eight days. The cases got well in from ten to eleven weeks, without scars.

Tuberculour of the skin (both vertucosa and ulcerosa) may be treated with the actual cautery and with mercurial plaster; scro/nloderwe (nodes in and under the skin of the face, neck, and extremities, with central softening and a cheesy pus), by arsenic internally and the sharp spoon, and subsequently iodoform and halsam of Peru.

Psovianiz, when acute, is a very distressing disease because of its intense itching. It has been known to originate from local irritation in the scars of vaccination (Bethman) or variola (Cazenave) It requires many and protracted baths and plenty of soap to remove the scales; unguentum hydrargyri ammoniati is used for the same purpose. Ichthyol ointment (from five to ten per cent.) has rendered me good service in the only case I have seen in a child for years. Betanaphrol has been highly praised in ointments containing from five to ten per cent. Neisser recommends chrysarolin ce anthrarolin ointments (from five to ten or twenty per cent.). They are positively dangerous in such doses, when used on children, because of the extensive crythema and conjunctivitis following them. On the head, therefore, he submitutes pyrogallic acid, but it dyes the hair black and is not so efficient. For chronic cases the principle of treatment is the same. The eruptions must be attended to locally; ichthyol ointments will also do some good. Chrysarobin ointments (from one to two per cent.), or chrysarobin in traumaticin in the same proportion, should be applied once every day or every few days. Green soap, or liquor potassii, a daily bath in scap and water, will dissolve the scales and facilitate the effect of the other applications. Internally, iodides will prove effective in appliilitic cases. Thyroid in small doses (one to two grains = 0.06 to 0.125 daily) has had some successes among many failures. The best internal remedy is arsenic in long-continued moderate doses. No stimulating food (no dark meal, or no meat at all) or beverages.

A number of congenital discuses of the skin and subsutaneous tissue are amenable to treatment; to them belong the scoplassus. Lipsus is found in two varieties: first, the circumscribed and capsulated; second, the diffuse. While the former is as easily removed as in the adult, the latter is sometimes inoperable, inasmuch as it extends over large areas, and resembles in some instances, or in some parts of the anomalous growths, a moderate or formidable surplus of normal fat only. I had to give up an operation for removal before

it was completed. Hard filworsa (connective tissue, circumscribed tumors) should be extirpated before it gives rise to facial leoutieur or elephantiasis (Trendelenburg). Soft fibrana (f. mollmeum Virchow, mostly multiple, with a tendency to immense growth, sometimes pendulous, councilive tissue with arcular structure) should be removed quickly from the cutis in which it develops. Kylsid is an hypertrophied cicatrix extending upward from the corinm, with rapid growth. Extirpation is nucless because of the new development of keloid. Daily painting with liquor potassis arsentis and outments of ammonium sulpho-ichthyolate in lanolin and lat, all 5 to 8 parts, may be tried. Repeated semi-weekly subcutaneous injections of a ren-per-cent, solution of thiosinamin is absolute alcohol (doses for adults grs. 55 to 155 = 0.04 to 0.1) have been recommended, as also for cicatricial contractures following lupus, etc. (Sinclair Tousey) Cysts and dermoid cysts are met with; many of them, though congenital, attract attention only after months or years. Atherosada (when small and superficial, embedded in skin only,-milta) are not infrequent about the head (eyehrows, etc.). They can readily be enticleated, and ought to be removed before they adhere to the skin and undergo suppuration. When they are suppurating, and removal is very difficult or impossible, tartar emetic in water (1 to 30) may be injected or potassium bydrate introduced. Fither of these will disintegrate the cyst-wall to such an extent as to render their removal by pincers possible after a day or two. Congenital surcossa has been described a few times, once by Neuhaus (Arch. f. Kinderh., vol. xxii., 1897), who collected a few other cases. The sarcoma commercial in the enheutaneous tissue. The only one beginning in the cutis itself was recorded by me for the Am Ped Soc., 1897. It was on the upper part of the scrotum, with small metastases on the dersum penis and no swelling of lymph-hodies. It was excised, the metastatic deposits destroyed with the thermo-cautery, and the haby treated with arsenic (Arch. of Ped., November, 1897).

Congenited ichthyanit is the result of an hypertrophy of the epidermis and the papillae of the corium, sometimes with dilatation of their blood-vessels, also with aderosis of the connective tissue, and usually with an exaggeration of the normally copicus secretion of sebum during the second half of intra-merine life. The elastic fibres are more or less absent. Sebum not removed, but thickened by epidernual cells and foreign material, forms scales, which may be thrown off, but are rapidly reproduced, and cause fissures and warts. This condition, when mild ("xeroderma"), is not necessarily dangerous to life. A boy of fifteen was freed of his scales by a permanent warm bath of five days. Lamolin immetions, with or without ichthyol (from five to ten per cent.), will prove beneficial. Arsenic should be given internally. Thyroid—with which, however, I have no experience in this anomaly—was given by Joseph and others with apparent success. I should favor its use also in congenital idiopathic atrophy of the rhin (head, face, hands, feet, nails, hair, which is totally absent), which otherwise is not reached by treatment. The affect of thyroid in mystedems and its alopecia should uncourage us.

The worst forms of congenital ichthyosis, which sometimes terminate fatally in a few days, are not amenable to treatment. Partial follicular ichthyosis, in which bony spinar grow out of hair- and tallow-follicles without affecting the general health, demands frequent bathing, green soap, plenty of fat inunctions, and a ten-per-centsulphur ointment; also salicylic acid in a saturated alcoholic solution.

Congenital unoplasms on the neck are: hygroms (lymphangioma with albuminous contents and endothelia); serous and dermoid cyats, sometimes so dense as to render their diagnosis from lymphatic tumors difficult when situated below and alongside the sterno-eleido-mastoid muscle; carcinoma and epithelial remnants of the branchia; primary endothelioma of the lymph-follieles; and surguineous cysts, mostly diverticula of veins, or in a few cases rudimentary developments of the jugular vein. They require either enucleation or an extensive incision with aseptic temponing.

Notwer pigmentosus and cerrucorus* helong here. Their treatment is similar to that applicable to vascular navi and tumors (p. 468), the latter differing from the former by a greater prominence of the skin, which is produced by elongation of the papilla and by hyperplasia of connective tissue; also to the narros lipomatodes, which is a spherical or cylindrical fatty excrescence covered with normal skin, sometimes pedanculated, sometimes sessile and with a broad basis. A few of the latter class are liable to grow out of proportion; all the rest in conformity with, or even less than, the rest of the body. In the majority of cases the time for an operative procedure is left to the medical attendant. Besides the methods of removal which

[&]quot;Solden (Arch. f. fills. Che., vol. lix.) claims it as a fibromatosis of the connective tissue of the corver. The "naceus cell nest" is not epithelicena (Unm) noe lymphongisthroma (Recklinghausen), but nescofibroma. Out of this are developed the soft warm and the soft fibromata, the serves of the skin and the whole periphery participating. Pigmentation is the rete Malpighii is a different process (melanusis).

have been detailed above, total extirpation is advisable in most cases. Indeed, it is the preferable method. Local amounthesia can easily be accomplished by ethyl bromide, or by a mild solution of excaine (grs. ½ or 2 to 100), or by Schleich's solution, mentioned on page 72, injected into the skin. Excusion is readily executed with but little loss of blood, and the sutured wound is covered with collodium. In a very few days, without a change of the collodion, recovery is apt to be complete.

XII

Diseases of the Muscles

Acure inflammation of the muscles-myoritis-is located either in the external or internal perimysium, also in the contractile elements. Cellular infiltration, coagulation, fatty and hyaline degenerations, suppuration, nuclear proliferation, and the formation of new connective tissue are observed as its morphological changes, with either incurable retraction or curable contraction as their results. Transmitte myositis (p. 90) requires absolute rest, the application of cold water or ice, after a while tincture of soline once a day or every other day, potassium iodide and lanolin ontment several times a day, or gentle massage without the cintment. Potassium iodide internally is indicated when thickening remains. If, after a long time, the muscle, though without pain, does not become normal, the electrolytic effect of the galvanie and the stimulating action of the interrupted current, in short sessions, may improve the condition. Both transmatic and obcamatic myositis have a tendency to relapses. The latter requires a treatment similar to that which has been detailed above, with this exception, that hot (dry) applications generally render better service, and the internal administration of sofium suffeylate is mostly indispensable. Immetions of oil of wintergreen are often useful, as are also diaphoretics. The isfections myositis of eruptive and septic fevers starts with a moderate increase of temperature, some sensitiveness on pressure, and occasional swelling, an effusion which is either serous or purulent, and requires accordingly, besides the active attention demanded by its origin and a careful differentiation from a possible affection of a joint, either expectant or operative (and antiseptic) treatment. In those rare cases in which purpora is observed at the same time, the myositis has probably a henserrhogic origin. Neuritis and myositis may appear together, as neuromyosin's, acute, subneute, or chronic, without or with relapses. It is rare, but of long duration, probably always of bacteric origin, and shows all forms of parenchymatous, interstitial, embolic, and himorrhagic changes. Syphiliz produces either gummata, which are often mistaken for sarcomata, or hyperplasia, and demands, in addition to internal specific treatment, either the inunction of an oleate of mercury or of the blue outment or subcutaneous injections of the bichloride. Tubercular deposits are

caseous and puralent; they must be incised, scraped out and irrigated, and the cavity filled with iododorm gauze. Purulent myositis is hanfly ever idiopathic, and its cause or complications must be ascertained (syphilis, tuberculosis, sepsis).

The chronic forms of myositis met with in children are, as a rule. outgrowths of the acute inflammation. The rare forms of trenmatic ossifying and of Attrifying myositis are hardly ever seen in childhood, with the exception of the occasional appearance of the multiple progressive occitying puriety,-a collateral to the cartilaginous exostoses,-which exhibits in (slightly febrile) acute attacks, or chronically, different stages (embryonal, fibrous, ossifying) of inflammation and bone-formation in the cellular tissue of the fascie. in the aponeuroses, and in the tendons of the back, the chest, the masseter, and the extremities; seldom of the abdomen, never of the heart, the diaphragm, or the sphincters. Sometimes it is complicated with absence, undersize, or ankylosis of the phalanges of the thumb or fagers. It is a nutritive disorder, always of congenital origin. Of forty-two cases (A. Weill and J. Nissin in Nour. Iconoc. Sulpit., 1898), twelve were noticed under one year, twelve from the second to the fifth, and ten from the fifth to the lifteenth year. No available treatment is known.

Ischemic muscular paralysis is the result of anamia (mostly local, as from the influence of cold). The pain, loss of elasticity, and resulting contracture require massage, gymnastic exercise and electricity, and the subcutaneous daily use of strychnise.

Trophoseuretic ill nutrition and paralyzia comprise two surieties. One is the result of inflammation of a joint; from disuss the neighboring muscles become atrophic and more or less paralyzed. The other originates in a charge of the spinal centres, as in policenyclitis, with fatty degeneration and atrophy as inevitable consequences. In both varieties systematic massage of the paralyzed muscle, executed with anatomical knowledge, will do good; in the first with mostly complete success. Electrical treatment and strychnine may be combined with it. The atrophy is very rapid, with but slight changes of electrical irritability (no reaction of degeneration), and localized. If the knee be affected, it is the quadriceps that is suffering; if the hip-joint, the gluttel; if the shoulder, the deltoid, infraspinatus, and teres minor; if the elbow, the triceps; if the wrist, the extensors of the forcarm; if the fingers, the interessed.

The pseudo-paralysis of rickety children is simply debility. Parnot spoke of pseudo-paralysis as the result of epiphyseal swelling. When the spenal cord is found altered (bemorrhage, abscess, excelin the fine wessels), there is no longer a "pseudo," but an actual paralysis. In congenital syphilis, muscular debility, with normal electrical irritability, may be observed about the first or third month of life. Muscular atrophy, progressive juvenile muscular dystrophy, procedo-hypertrophy, and congenital myotonia have been mentioned above (p. 271).

The affection which has been described as grave pseudo-paralytic agustificate, and which consists in a peculiar exhaustion of the muscles on slight exertion, to such an extent as to render voluntary contraction very difficult and so rapidly diminish electrical excitability, appears to depend either on defective innervation or on chemical changes. In the single case I have seen, in which no causal diagnosis could be made or suspected, except a general muscular debility common to most members of the same family, massage and strychnine rendered some service. Veratrine, physostigmine, and digitoxin are recommended. In neurasthenia the muscles are also unduly exhaustible, but it differs from myasthenia in this, that the nerves are excitable. A good many cases so described should be thoroughly studied. The results of polioencephalities or other brain lesions and the incipioney of brain tumors have often been taken for "myasthenia."

Torricollis (caput chatipuss) means a contraction of the sternoeleido-mastoid muscle, mostly its stemal end; the head is turned to the affected, the face to the opposite side, and the diseased side is not infrequently more or less atrophic. The treatment depends to a great extent on the cause of the contraction. Spasmodic torticollis resulting from reflex of the sensitive nerves of the cervical plexus requires the section of the latter. Malgosition in the uterns is an occasional direct source, as also the hamatema originating during birth, or later, which has been mentioned elsewhere (p. 90). Bilateral caput obstigum, with the result of forcing the head backward, has been observed in very young infants. In a case of Shaffer the head was drawn forward. No blood was found in the worder, but only firm connective tissue and atrophy of muscular three. This interstitial fibrous myositis depended, probably, on a number of minute traumatic lesions during parturition. Tumors, such as sarcomata. have the same influence on the function of the mustle. This is immaired, in advanced childhood, by sudden strains; for instance, by kite-flying, by loads carried on one shoulder, occasionally also be an abnormal position of the head, enforced by paralysis of the ocular muscles, in order to avoid double vision (Landolt). Rheumatism of the muscle, isolated or more general, and of one or more vertebral articulations, and caries of the vertebrac have the same effect. Sodium

salicylate internally, oleum gaultherize, and ammoniacal or camphor inunctions will do good. The same may be said in regard to muzewhas electrostism in general. Torticollis is also one of the symptoms of the acute rhermatism of the neck which, because of its serious symptoms (fever, vomiting, delirium, with no irregularity, however, of the pulse), has been mistaken for meningitis. Sometimes it depends on a neurosis (neuritis?) of the accessory nerve. In that case the scalenus and trapezius muscles are also affected. Reflex torticollis has been mentioned in connection with intestinal worms and with carious teeth, and an intermittent form is known to exist (Forchbeiner) and to depend on malaria. In these cases quinine and aromic are indispensable. Worms must be removed, teeth corrected. A. L. Gillette says that he cured a case by the removal of adenoid growths. In those cases in which heavy loads carried on one side cause contraction of the other a systematic use of the diseased side will restore the equilibrium. Exaggerated and forcible swinging of the arms will secure co-operation and exercise of the numcles of the neck. Massage both of the muscles and of the articular processes of the cervical vertebræ from the third to the fifth is required. The galvanic current in mild doses relieves spasm. Gentle rubbing with landlin (in inflammatory cases with potassium iodide or mercury) is beneficial. Cold temperatures must be avoided. Otherwise uncommerable cases require tenotomy, to be performed by open incision, which protects the jugular vein better than the old operation from inside outward. When tenotomy is not sufficient, Mikulica practises the total extirpation of the sterno-cleido-masteid muscle. Too violent attempts at reduction way prove dangerous. Brackett (Eleventh Meeting Amer. Orth. Assoc., (807) met with alarming changes in pulse and respiration, which he attributed to adhesion and shortening of the prettmogastric nerve.

XIII

Diseases of the Bones and Joints

1. Congenital Anomalies.

OF the congenital mal/ormetious of the extremities (bones and soft parts), many are not accessible to treatment. To this class belong arrests of development, either before or after their formation. and spontaneous amoutations. Curvatures of the limbs (congenital, through fracture of the tibia) may require osteotomy or osteoclasy; but their domain is not very extensive, for in the large majority of acquired rhachitical curratures of the legs recovery takes place spontaneously. Observations in the surgical clinic of Tillingen, extending over a number of years, prove that seventy-five per cent, of all such curvatures will straighten in from two to four years. When the patients were first presented, plaster-of-Paris casts of the dekemities were made, and another examination took place after an average of four and one-half years. Improvement was noticed in 15.3 per cent, additional. In 9.7 per cent, only no spontaneous recovery or improvement took place. It is in these that operations are demanded. Supernoverary sugers and toes are either removed from their cutaneous attachments or extirpated from their sockets. Comrenital enlargements of toes, consisting in hypertrophy of both bone and fat, are removed by amputation. Universal giant growth is always congenital, but not hereditary. The connective tissue, muscles, bones, and blood-vessels, all of which evolve out of the mesoderm, are equally affected. The nervous system and the joints are normal, the skin sometimes thickened, the nails correspond with the phalanges. Whether it is related to acromogalia (which in its full development is observed in later years only, but may originate earlier) remains to he seen. For the present it is not amenable to treatment. Synechia of (nybbof) fingers and toes must be separated; the operation being difficult, it is best to delay it for some time, but not long enough to endanger the growth of the organ. Division of web, with suture of the preserved skin on one farger and Thiersch's grafts on the other, or the latter on both fingers, is asserted to be the best treat-

Multiple infantile exertoses are congenital, sometimes hereditary, very rarely syphilitic, and then recognized by, or connected with, other symptoms of syphilis; they develop early, now and then only after palserty; grow near the periepiphyseal cartilage, between epiphyeis and diaphysis, sometimes from the cartilage of the epiphysis; sometimes found on scapula, polyis, and grantum; in rare hotances grow even after the completion of the growth of the body; in some instances surrounded by a synovial membrane (exostosis hursata); remain cartilaginous or become osseous, and then may interfere with the growth of the bones. They do not often disturb the functions of the long bones and joints, but the ulra has been known to become crippled by them, the skin may ulcerate over them, and the synovial capsule may be raised by one growing too near the joint These complications tometimes require special treatment and attention. Exostores, so long as they are but few and not combersome, are best let alone. However, in the next case of early age seen by me I shall give phosphorus (p. 130) systematically, for the pergose of enforcing speedy ossification, both local and general. Extirpation is indicated when there are but few, and when these are large; under careful asepsis the operation is at present devoid of danger. Potassium iodide has been administered extensively without apparent effect. When sephilis is suspected, mercury and iodides should be given a trial.

2 Congenital Luxuinus.

Congenital Juration of the hig-joint, with the exception of rare cases depending on injuries contracted during birth, in the result of scantiness of Equee annii, by which, in the cramped position of the focus, the growing femur is pushed out of the socket, or, in other (rarer) cases, of an arrest of development of the acetabulum, which is sometimes hereditary and now and then complicated with other malformations. The head of the femur finds no accommodation, and the treehanter is found above its normal place. This is particularly so on the steep os illum of the female. When the luxation is unilateral the gait is limping; when bilateral, waddling. Extension lengthens the extremity and conceals the deformity. Treatment is either mechanical or operative. Until a few years ago the mechanical treatment was the only one generally recommended. Volkmann relieft on permanent extension, particularly in unlaberal cases. Hesing has good results with his apparatuses. Schede uses splints, with pelvic support, to extend and to abduct the extremity, for from two to four years in succession. He finds the indication for this treatment in bilateral cases up to the fourth year, in unilateral cases up to the eighth or eight, for the radiment of the acetabulous whose size can be improved upon frequently persists up to that period of life. Pari

lost a girl of seven years by dysentery four months after reduction and extension of her bilateral dislocation; he found at the astopsy two new joints which appeared to promise stability of the femoral head in the new position, if the child had lived. Ten years ago the results of operations appeared to be very favorable. At the Congress of German Surgeons of 1804, Lorenz-in that of 1804, Hoffa -prescrited very satisfactory statistics and patients. Neither of them guts the muscles, but both reduce the dislocated limb by powerful extension. Hoffa's incision is longitudinal, like that made for resection (Langenbeck); the capsule and soft parts are loosened from the trochanter by subperiosteal operation, the acetahulum is enlarged and the head fitted into it. The superfluous capsular tissues are then extirpated, the wound is filled with iodoform gauze, and an extension apparatus applied. The extremity begins to grow, shortening becomes less, and both head and acetabulum gradually increase in size. Hoffa's operations were performed between the second and eighth years. He presented the statistics of one hundred and twelve operations performed on eighty-two patients without cutting muscles. The last forty-seven terminated without a death. Lorenz's incision runs anteriorly; he does not touch the insertion of the muscles.

Later, A. Lorenz " published his objections to the protracted employment of extension, which keeps the patient in a recumbent position, possibly for years, and interferes with the nutrition and function of the limb or limbs. Instead, he extended forcibly, under amosthesia, and reduced the head of the femur, the reposition being maintained by strong abduction. The head of the femur is then retained in the small acetabulum by apparatuses and the abduction is gradually diminished. After a while standing and walking are permitted. At first, while abduction is continued, these movements are clumsy and difficult, but when the weight of the body and the constant friction have deepened the acetabulum, they become easier by degrees. The oldest child in whose case this procedure was successful, the luxation being bilateral, was six years and three months. In one case of milateral luxation standing and walking were interrupted three days only, in others several weeks. Even when the luxation was bilateral they were not long delayed. Two patients were able to stand in six weeks. To ascertain the actual result of a successful reduction, the X-rays have been employed before and after the treatment. As a result of more mature experience, public opinion among surgeons is swinging back to mechanical treatment

^{*} Contralblatt f. Chir., 1805, No. 23; Sammi, Mis. Vortr., 1806, Not. 150, 151.

almost exclusively. Schede, Hoffa, Lorenz, Wolf, and Kummell (Acros, of Germ. Phys. and Not., (806) immimously discredit any bloody operation in the treatment of even severe cases. It should be rescrited to as a last resource, and promises no success, but is risky. Schede reported ninety-nine cases of infants and children up to fifteen years of age, ninety-eight of which recovered with manipulation only. Lorenz reported eighty-three cases treated by manipulation, and extension in abduction, successfully (A. H. Tubby, London Lancet, May 1, 1807). The advantages of mechanical treatment are its simplicity and the avoidance of the danger connected with every great operation, of sears, and of probable contractions in liner life. One of the latest contributions to the subject is by A. Codivilla (Zeitrch. J. orthop. Chie., vol. (x., 1601). According to him, the bloodless treatment is easiest in early childhood. Only four or five of sixty-six cases reduced were perfect physiological results, but the fratetional result was good in practically all of them. Bloodless methods were successful even in cases as old as sixteen years; the immobilization of the reduced dislocation in a position of more or less marked abduction must continue from six to nine months.

Congenital lanation of the base-joint is not so frequently observed as that of the hip-joint. Still, G. Muskat collected (clrck, blin Chin, vol. liv.) seven gennine luxations, four contractures in flexion, and seventy-one incomplete luxations. Massage, cautious attempts at restoring motility, and—under the most urgest circumstances only—opening of the Joint are recommended.

Congrecial dialocation of the scapule is rare. A mild degree is caused by an incompetency (congenital) of the trapezius minde.

Congenital dislocation of the shoulder was observed in rare instances as the result of trauma during parturition. F. S. Eve (London Lowest, May 1, 1897) describes two cases. In one the head was below the spine of the scapula; in the other the joint was found "normal, the head elongated obliquely backward." Redundant cattilage was shared off and reduction performed.

Twenty cases of congenited distocation of the radius, mostly barkward, were collected by A. Ernstberger, who, like his father, laid it, together with symmetrical anomalies of the finger-nails. In his own

case there was also a subluxation of a patella.

t. The Bones.

Fractures heal the more readily the younger the patient. Callus is speedily formed, and, the muscles being feeble, dislocation of the ends of the boxes does not take place to any considerable extent.

Elixir of phosphorus in increasing doses will hasten consolidation in the feeble and americ. The fracture of the humerus occasioned during birth requires a light splint with but little wadding. A piece of pastelocard and a few strips of adhesive plaster or a handage, and the support of the limb by fastening it to the lody, are sufficient. Clavicles heal readily when tied up in a triangular cloth, the arm being fastened to the body. Fracture of the clavicle during labor is often followed by permanent paralysis of the corresponding upper extremity. Where moistening by urine, etc., is feared, the handages should be painted with a solution of resin in other (1 to 10).

Perichandritis and astrochandratis occur, of course, in earliest infancy only, mostly under the influence either of rhachitis, or of syphilis, or of acute infectious diseases, most frequently in the forearm and the leg, also on the ribs or clavicles, or stemum or larvax, and terminate either in cutaneous infiltration or disruption of epiphyses. Pain is rare, and the "pseudo-paralysis" of Parrot means but the functional disturbance due to infiltration of the tissues. Periorititis, sufritir, and sutromyclitic are due, in the first instance, to the disposition created by the activity of metabolism and by the physiological succulence of the bones, whose growth starts from the periosteum, from the marrow, and from the periepiphyseal cartilage. The vulnerability of general scrofula and herolitary influences add to their Eability to become diseased. Proximate causes of inflammation are trauma, colds, infectious diseases such as whosping-cough and measles, and the invasion of cocci and bacilli through the skin, umbiliens, mouth, tonsils, or any other sore surface, also the respiratory and digestive organs, with the resulting senticopyamia. Infection may be intra-sterine. The termination of periostitis is either in absorption, or thickening, or suppuration. In albumineus periositius pusis substituted by serum and fat. In scrofulous and tuberculous children osteitis is mostly found in the short bones and in the epiphyses. The hours swell, become softened (porotic), and in their interior supperation loosens the tissue and dilates the medullary spaces so as to infate and expand the thin external layer (aring tyutosa). Tubercular acteirie softens the bones into a yellowish caseous or fungous mass, and thereby forms cavities, which may heal by means of absurprice of the liquid contents and calcification of the remnant, but wordy end in caries or necrosis, in sinuses, in persistent supporation, and not rarely in amyloid degeneration. The degrees of the different forms vary considerably. For instance, necrosis may be superficial, with a favorable prognosis; or central, with the formation of a

sequestrum the removal of which incites granulations and new formation of bone; or total, and thus removes whole bones, such as the calcaneum, the cuboid, entire phalanges, or the disphysis of the long bones.

The prognosis is best when the process is superficial. Absolute rest, elevation of the limb, cold applications, tincture of lodine, and sleep incision in case of very severe pain which betrays the presence of pus comprise the proper treatment of acute periostitis. Chronic thickening will usually be reduced, perhaps even removed, by moderate pressure, potassium iodide internally, and (or) an continent of the same with lanolin. Syphilitic periostitis requires potassium iodide. in increasing doses, occasionally combined with mercury. Osteitis, and outcomyelitis (deep, agonizing pain, with but little swelling at first) require a treatment similar to that of periostitis. The bone should be kept at rest, well elevated and supported by splints, and see applied. In mild and slow cases tincture of iodine or the ignipuncture of Kocher yields favorable results. Syphilis demands its specific treatment no matter where met with. It should be remembered that syphilitic ductylitis, in the shaps of spins ventosa, carnot always be illiagnosticated, clinically, from the tuberculous form, also that syphilis and tuberculosis may be found in the same haby. In such cases a protracted antisyphilitic treatment is indispensable. Incision may strike an abscess, which is then drained. A sequestrum is remored, and will be replaced by bone so long as there is no dangerous general affection. Antisoptic irrigations are indicated in most of these cases, and antiseptic applications should be made constantly unless sterile games be used to fill a cavity or sinus. When caseous degeneration has taken place to a great extent, the question of mere scraping or of resection presents itself. Osteomyelitis requires an early operation, sometimes within a few days after the appearance of the first symptoms. Esmarch's bandage, the chisel, and the sharp spoon are the main reliances of the surgeon; the seat of the disease must be reached and entirely uncovered; counter-openings and ample tumponing may be demanded. Spina ventosa should be treated in a similar manner; part of the remaining external osseous layer should be removed and the cavity filled with iodoform or other antiseptic gauze. Obstinate sinuses must repeatedly be scraped. They nite: heal under a carefully conducted Bier's treatment (p. 507), with parenchymatous injections of an iodoform emulsion into the surcounding tissue, not into the sinus itself.

In every case of this kind-in fact, in every case of subscute or chronic inflammation of the osseous tissue-phosphorus ought to be given. It may be continued in such doors as are recommended elsewhere (p. 131) for two or three mouths in succession.

Tuberculosis of the body of a vertebra (more frequent than that of the arch or of a process) underlies spondylists in almost every case. The intervertebral cartilages are but secondarily affected. In many cases a trauma is charged with being the proximate cause, in others the process develops spontaneously, with but few symptoms. Stiffness on moving, pain on moving and pressure, very little, if any, increase of temperature, and inability to bend and rise without support on a knee or some near solid object are quite often the persistent, but only, symptoms. When spondylitis is cervical, it is hable to produce bradache, dysprora, and retropharyngeal abscess; when lumbar, poin in the thigh or symptoms resembling those of coxitis. Usually there is at an early period pas either in the bone or at some distance from it. It finds its way along the fascia, rarely into the vertebral canal, and is met with in the lumbar and gluteal regions, in the small pelvis. along the psoas and internal iliac muscles, and along the rectum. The latter occurrence is unfavorable because of the slowness-if at allof recovery. Lumbar and gluteal abscesses are more readily discovered than those of the psoas, and therefore more amenable to treatment. Incision, wiping out with aseptic gauge (better than irrigations), and injection of a five-per-cent, iodoform-glycerin emulsion will lead to recovery, provided the suppurating and tubercular vertehra heal out. Even psoas abscesses close up in that way, after the destruction of the pyogenic membrane. So far as the spondy litis is concerned, there is, unfortunately, rarely a recovery without some deformity; but if treated in time and properly (corset with or without jury-mast), recovery may take place without it. Permanent gibbus should be avoided. Cases with much suppuration exhibit lasting and marked kyphosis (Pott's disease), or scoliosis, or kyphoscoliosis. As soon as the diagnosis can be made, the patient must remain on his mattress, with a moderate amount of extension. Ice will relieve local pain. When it is moderate, tincture of jodine will answer. Huster recommended the subcutaneous injection of a twoper-cent, solution of carbolic acid. When there is no fever, the time for a plaster-of-Paris jacket, according to Sayre, has arrived. What the latter requires, however, is that the child should not be too young. To be useful, a certain length of the spine is necessary. Thus, it is principally in the dorsal spondylitis of children of a certain age that it exhibits its best results. The jury-most is added to support the head and thereby to reduce local pressure in cervical cases. Abscesses gravitating downward are better not touched before they reach

the surface. Then, before their spontaneous perforation, antiseptic irrigations and the use of iodoform emulsions are indicated.

Most cases of spondylitis are tubercular, and either primary or secondarily infected by a mediastical lymph-node; some (either tubercular or non-tubercular) are traumatic; very few the result of a neoplasm. Abscesses are frequent and difficult to diagnosticate. They and caseous abscesses may cause a peripachymeningitis and narrowing of the spinal canal, with paralysis. This may terminate in recovery, sometimes after a long rest and potassium indide, etc., treatment, sometimes after operations. The resection of parts of a vertebra is mainly indicated in old cases of (almost) complete paralysis, recovery from which may take half a year or a year. The disease is dangerous because of its origin and its effect. Preventive treatment is always indicated, and mechanical treatment should be gentle. Calot's earliest method of rapid reduction, with or without removal of spinous processes (thirty times in thirty-seven cases), has naturally resulted in several deaths. The author's intrepidity and his disregard both of human life and of public opinion were wonderful to behold. Later he changed his method, proceeded slowly-that is, "several seconds"-in accomplishing the reduction of the prominence, and then used plaster extension with a weight of from forty-five to one hundred and thirty pounds. Those who have followed his procedures are not edified by their results.

A number of cases described as chronic articular rhousation are undoabtedly those of arthritis deformant. The differential diagnosis is perhaps best made by remembering that the term "rheumatism" is still too vague to allow its use for diagnostic purposes. The only condition which deserves it is acute (or subacute) articular rheumatism, rheumatic polyarthritis. It affects the synovial membranes, Gost (the affection has also been called "rhesmatoid gost" or "rhenmatoid arthretis") implies uratic deposits. Arthretis deformans in an affection of the cartilage (influenced by anomalies in the bones?). first, proliferation between the intercellular fibrillar, then absorption. with, finally, hyperplastic eburnation around the absorbed cartilage and distortion of the limb (the hand in the ulnar direction mostly, with intact thumb and thoroughly enlarged phalangeal ends). A similar process takes place about the shoulder, eihow, knee, toes, and vertebras. The heart has been found affected in a few cases, but as a complication with rather than a part of the disease. Marked cases of arthritis deformans such as I have seen myself have been published by A. G. Nichols (Montreal Med. Journ., 1896), H. Kopikk (Arch. Ped., 1806), who collected eighteen, and Vargas (Bull offic. de Barcelona, April, (807). (He counts "Jacobi among those who shi not mention the disease," erroneously.) Very suggestive also are the early changes which take place in the skin and the rest of the epidermoid tissues and in the muscles. The accompanying changes in the muscles,-a slowly progressive atrophy with corresponding paralysis and contracture of the antagonists, and nodes on tendons, the atrophy being very marked in the interessei, without reaction of degeneration, and with only so much alteration of electrical and galvanic excitability as is explained by the atrophy of the muscular tione,-trophic changes of the nails of fingers and toes (thickening, fragility, and extoliation), and those of the skin (vitiligo and chleasma and dight indications of scleroderma, even ichthyosis in a few Instances 1), appear to prove their great-difference from rheumstism and their very intimate connection with the nervous system. which is known to influence greatly both bones and joints (S. Weir Mitchell, Clin. Less. on Nevr. Dis., 1897). Consequently the antirhemnatic treatment, by salicylates, etc., is absolutely useless. The galvanic current, slowly increasing doses of arsenic administered a long time, protracted warm bothing at home or in Wildlad, Oernhamsen, Nanheim, Toplitz, protracted exposure to hot air of from 120° to 150° F. (Tallerman), and judicious massage have served me best. Arthritis deformans is not incurable. There must be no absolute rest.

Not always are many joints affected. The chronic anhylosing inflammation of the vertebral column, which may run a protracted course without an affection of the small joints, and the cases of monarticular stiffness of the jaws appear to belong here.

4. The Joints.

Inflamentations of the joints are frequent,—more so in inflancy than in childhood. Acute cases are rare, however, in children eight or ten years old, who have more control over their muscles and take better care of themselves. Younger children are more exposed to transmatic injuries; besides, not to speak of the phlebitis of the newlyborn, there are in the earlier years distinct preciseposing causes of joint disease in such infectious diseases as scarlatina and diphtheria. Syphilitic joint diseases appear in infancy and childhood in different forms,—as epiphysitis with effusion into the joint without synovitis and without supparation; as coteins with effusion and with guntuatons infiltration of synovial membranes and effusion; as primary guntuatous synovitis (rarely); as symmetrical synovitis (mostly in

^{*} Conscionant in Schmidt's Jahrb., 1895, No. 8, y. 220.

the knees) in children of from eight to fifteen years, at the same period of life in which the intersticial keranitis of syphilis is commonly found. In all of these affections a thorough and protracted antisyphilitic treatment is required. In all joint diseases the synovial membrane, the fibrous capsule, and the cartilage are affected either separately or collectively, and the contents of the diseased cavity are either serons, or purulent, or fungous. Most of the latter are tubercular, and were known to be so long before the tubercle bacillus was discovered; indeed, as early as 1873, Köster recognized the tubercular nature of "tumor albus."

The prognosis is fair when the secretion is serous. Fluctuation is easily recognized when the joint is superficial. It remains as "hydrarthros" in chronic cases. The treatment requires absolute rest, and in the acute stage the flexed position of the limb-which is either voluntarily chosen because it relieves tension or is the result of a reflex contraction-must be respected. Other aids are; cold applications and mustard-plasters; in less argent cases, tincture of sodine, pure or diluted with alcohol, once or twice daily; in chronic cases, a vesicatory either to its full effect or applied for half an hour only, and repeated daily or several times a day; later, continents of potassium iodide and lanolin, or mercurial plaster, which may be made to cover the whole joint and may be changed once every few days; two daily applications of induform in collection (1 to 8 or 20) over the whole joint; compression with a rubber bondage over a proper pasteboard, felt, or wood splint, the latter to protect the neighboring large blood-vessels. Potassium iodide internally will render good service while the affection is of a purely inflammatory character. Persistent contracture must be overcome by massage, cautious passive movements so long as there is no pain, and foreible extension, either without or with amesthesia. Massage improves the prognosis in subacute serous inflammation of the joints, also in contusions and distortions; after the massage the joint should be immobilized, slightly compressed, and raised. It acts well in chronic (rhenmatic) inflammarion, with thickening and proliferation of the capsule. Villous proliferations should be broken up by manipulation and changed into a detritus.

Tubercular cases have a decided tendency towards either suppuration or fungous degeneration. About the knee the abscess is sometimes outside the capsule and permits of an incision which does not reach the interior. Still, a small communication with the latter is almost always present. The opening of intracapoular abscesses, once so dangerous as to be considered semi-criminal, is no longer feared.

Repeated aspirations of the pas under aseptic precautions with subsequent injection of sterilized iododorm in oil or glycerin (1 to 5 or 10), or in liquefied vaseline, and intra-articular occasional operations, such as scooping, resection, etc., with tamponing and draining, have reduced the dangers and are daily swelling the records of recoveries. General treatment to overcome the amenic and cachectic condition, and particularly antitubercular hygiene and medication, are demanded in most cases.

Lately (Deutsche Zeitsch, f. Chirurgie, vol. xli., July 30, 1805. p. 178), E. Wieland published a contribution to the treatment of surgical tuberculosis in childhood with iodoform injectious which, to my mind, contains everything now known on the subject and all that is sound and advisable. Iodoform treatment, however, is certainly not a parmora. Cases of inhercular coxitis, for instance, complicated with large abscesses and with perforation of the acetabulum. which offer great difficulties in the way of irrigation, of thorough cleaning out, of injections, and of compression, are liable as well to resist iodoform treatment as to yield unfavorable results after a radical operative interference. But in a large percentage of cases injections of iodoform emulsions, aided by orthopædic measures (bandages, stays, plaster of Paris) or by mild operative procedures, and last, but by no means least, by constant attention to the general health (air, food, clothing, and bathing), and by medicinal support with arsenic, creosote, or, preferably, guaiacol, vield good results. It is true that this treatment takes patience and time, is even apt to be expensive, and certainly exhibits no tangible proof of a great surgical achievement to the impressionable lay mind; but it is efficient, and has the advantage of not interfering with the growth and development of the limbs, which are mostly injured, and permanently so, by subjecting the epiphyseal cartilages to a radical operation. In a few cases the absorption of iodoform, when employed in solutions, has proved dangerous through a consequent toxic nephritis. For this reason, solutions in other or oil are not to be recommended; for, after all, it is the local effect of sodoform which is aimed at, and not a general one. Emulsions are preferable. Krause employs a suspension of ten per cent, of iodoform in water, with the addition of but little glycerin and gum-arabic.

The places to be selected for injections, according to him, are: for the wrise-joint, below the styloid process of the nlm; for the elbow, above the capitulum radii; for the shoulder, exteriorly to the coracoid process; for the hip, above the troclanter major; for the lines, below the patella; for the ankle-joint, below the malleolus. in an opward direction. The mjection into the hip-joint is made. according to Kuster, who has followed that method these fateen years, at the interior margin of the sartorins muscle on a line drawn between the crossing of the femoral arters and the prominence of the trochanter major. That is where, in lean persons, the spherical head of the femor is hable to be felt, and where in counts visible or palpable swellings are not uncommon. For at this point the capsale is thinnest, and here, also, is the location of the subilize bursa. which in ten per cent, of the cases communicates with the joint. Asa trocar may hurn the cartilage, a hypodermic syringe is employed the canala of which has a length of from five to seven centimetres and a thickness of one millimetre. Kuster does not irrigate the joint. because in a large proportion of the cases there is either no fluid at all (parenchymatous synovial tuberculosis), or when present it is either sero-fibrinous (hydrops tuberculosis) or purulent (cold abscess). Neither Bruns nor Kuster believe that an irrigation with a threeper-cent, solution of boracic acid or another antiseptic has any better effect than the uncombined injection of iodolorm. In the parenchymatous variety from five to ten enlike contimeters (one to two and a half fleidrachms) of a mixture of twenty per cent, of iodoform and eights of glycerin are employed; this operation is performed weekly (Bruns). In the serous or purulent variety, after the fluid is either aspirated or spontaneously discharged, from ten to thirty cubic centimetres, enough to moderately fill the cavity (two and a half finidrachms to one fluidomice), are injected. This procedure is researed every two or four weeks (O. v. Bingner, Contrally f. Chir., No. 51, 1802, pp. 1057-1064). Periarticular abscesses should be incised and scraped thoroughly before an injection is made. The same holds good for fungous degeneration of the capanie of a joint. Bones in a very diseased condition—the talus, for instance—should be removed entire. If pus cannot entirely be removed, counter-openingsare required. At first, for the purpose of thorough cleansing and disinfection, irrigations may be made with a mild solution of mercuric bichloride (1 to 2000), to be followed for a few moments by a stronger one (1 to 1000 or 2000). The principle of conservatism must never be lost sight of. All are unanimous at present that conservative trestment is the more organtly demanded the younger the patient. Radical operations are indicated only when the case is one of extensive and protracted irrestediable importation with progressive distruction of tissue. Resection, however, must not go beyond the cartilage between epiphysis and diaphysis. If tuberenlesis be markedly developed, either locally or generally, it is better to amoutate than to resect. Fistule which do not contract or shorten should be treated with strips of gauze dipped in equal parts of balsam of Pere and alcohol, and when they are very dry and indolent with (Villate's) injections, composed of copper sulphate to parts, zinc sulphate to parts, and distilled water 120 parts; or a fuchsin ointment (1 to So landin and 20 fat). It is particularly the knee- and elbour-joints that require conservative treatment, both cautiously and patiently.

Another method of conservative treatment of tubercular joints has been introduced by A. Bier (Arch. J. Alin. Chir., 1894, p. 306). Encouraged by the fact that lungs in a condition of passive hyperarmia resulting from cardiac disease or from kyphosis have a rather pronotinced immunity from tuberculosis, he advises to produce a passive venous congestion of the tubercular joints by bandaging the limb tightly below the affected joint and compressing it above with an India-rubber land (Esmarch). To secure a moderate amount of hyperzemia and evanosis, and to avoid undue pressure and cedema, the handaging should be gentle, be interrupted once or twice a day, and not continued through the night and when there is a suspicion of phlegmon. Such a degree of possive hyperemia is known to give rise to the new formation of connective tissue and to induration. That hyperzemin, it is suggested, affords a certain degree of protection against the proliferation and action of bacilli; it is "bactericide." This is also the effect aimed at by Landerer when he recommends cinnamylic acid, and by Lannelongue, who injects one clabride for that purpose. That such was Koch's original theory when he introduced tuberculin is well known.

It is only very docile children that submit to the treatment readily. That is why days should be spent on playwise application of the method and on gaining the good will and the confidence of the patient. Bier continues his treatment at least three months. Massage, formerly used simultaneously, he has discarded. He found his method particularly practical when employed for tuberenlosis about the ankle-, knee-, and elhow-joints, also for the testis, loss so for the shoulder, not at all, as yet, for the his-joint. He found, however, that if there was much suppuration, the limbs thus observered tended now and then to acute inflammation, lymphangitis, or crysuelas. Ulcerations increased to size, but finally healed; sometimes large gramulations sprang up, but recovery eventually took place. Tubercular sequestra were often absorbed, and sometimes family attached to and embedded in the surrounding osseous risone. Even inhercular skin was benefited by frequent dry cupping, but not to such an extent as joints and hones by the above treatment. Glands were not accestible to the same method, except the cubital. Carcinoma, sarcoma, lupus, and syphilitic swellings were rather the worse for it; so was extensive supportation with streptococci and staphylococci. In acute rheumatism the effects varied; in gonorrheal joints, chronic articular rheumatism with no score exacerbations, and arthritis deformant they were fair. If carried out with care and perseverance, Bier's method sometimes yields astomshing results. (See Willy Meyer's report before Orthop. Section of the N. Y. Acad. Med., Amer. Mad. Sing. Bull., 1895.)

The treatment, however, is not always to be confined to this method alone. Abscesses are aspirated, if possible, in their upper part to avoid persistent discharge, and filled with a temper-cent, iodoform emulsion. Slight compression may follow, and the injection is repeated in about a week. If there he considerable purulent discharge, the iodoform treatment is continued or Villate's solution (p. 507) employed. Under its use bone fistular heal rapidly. If loose splinters be accessible, they are removed. Forcible extension by apparatmes under arcesthesia, tenotomy, and plaster of Paris should be employed in the treatment when indicated; so should passive movement, massage, and warm baths, particularly where there is Junctional aritylosis. True ankylosis requires resection when the false position of the extremity becomes intolerable, for a considerable curvature of the lower extremity of the extension of hyperextension of the upper cannot be beene. That generous diet and proper hygiene and antiscrofulous and antitubercular medication must not be omitted in an ailment which is either the result or may be the beginning of a generalized infection is self-evident. The best results of the treatment of inhercular hones may be expected in the calcaneum; its anterior portion is mostly affected because its spongy part has a scanty circulation only and its medullary part is large and soft. For the same reason sequestra may be found, which are rare in the other boots of the tursus. As it is least connected with other bones, its tuberculosis remains mostly local, but may affect the adjacem tendons (Finotti).

So far as the anticubercular treatment with guaiacol is concerned, I can but repeat what I said on the subject formerly. No one treatment of all forms of tuberculosis ever satisfied me to the same degree as has that with guaiacol. In the different varieties of pulmonary tuberculosis, when the distructive process was not too acute, it has almost invariably improved both appetite and general condition, rendered expectoration less purnlent, and increased the weight of the body as well as improved the complexion. The more chronic the cases the more perceptible is the effect of guaiacol. Thus, in tuberculosis

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of the osseous system its action is very satisfactory. The dose for a small child is from a drop to two or more drops, to be repeated three or four times a day, or guaiscol carbonate in three or four daily doses of from one to three or four grains each. Both of these preparations, particularly the latter, may be combined with other drugs, according to indications,—preferably with arsenic in generalized tuberculosis of the soft tissues, or with phosphorus in extensive inflammations of the bones of a chronic or subscute nature.

Coxitis begins mostly in the head of the femur, and is rarely attended by very acute symptoms. As it is curable when recognized early, every case of dragging, of untimely fatigue, of favoring either limb, of vague pain, and of slight increase of body temperature in the afternoon requires careful and repeated examination. Pain in the knee depending on irritation of the obturator and internal sauhenoza nerves is not increased by pressure. Limping and apparent lengthening of the limb with abdaction and shortening with adduction are found not to be actual, but the result of voluntary change of position. These conditions are overcome by rest, the local applications mentioned above, and conscientious extension in bed. At a later period, when all the symptoms of acute irritation have disappeared, extension by apparatuses and counter-extension may be employed for the purpose of permitting active exercise (Taylor's and Phelpo's extension splints). When, however, the swelling increases, an abscess is formed, and perforation takes place, a spontaneous luxation will often be the result, with either elongation or shortening (luxution upward and backward with adduction and inward rotation of the extremity). The or illum may perforate, or what is left of the head of the femur may start for the sciatic foramen, or upward, and all of the head may be lost by suppuration. Even in these bad cases partial recovery sometimes takes place. A new joint may be formed or actual ankylosis result from the healing surfaces joining one meether. The size of the incisions will depend on that of the abscesses, and the operations on the bones on their condition. Compicte resections ought to be made in as few instances as possible; the perieniphyseal cartilages controlling the growth of the limb require careful protection.

Tubercular coxitis is eminently a disease of early age. Nearly fifty per cent, of the cases occur during the first decade of life, nearly forty during the second. One-third of all the cases remain free of supparation; of these, seventy-seven per cent, get well; of the purulent form only forty-two. Altogether, about forty per cent, terminate fatally, death ensuing from tuberculosis of the lungs or of the meninges, or from general miliary tuberculosis, amyloid degeneration, or exhaustion by supportation or by sepsis. About fifty-five per cent. get well under conservative treatment; still, the motility of the hip-joint is impaired by contraction, so that either adduction (in two-thirds of the cases) or abduction, with accural or apparent shortening or lengthening of the extremity, results therefrom. Actual shortening depends either on retarded growth or (in the process of home destruction) on displacement of the accetabulum, which is more frequent than apontaneous luxation; apparent shortening results from the voluntary elevation of the hip, or by fixing the extremity in adduction parallel to its fellow.

The general rules of constitutional and incal treatment hold good for goods (inflammation of the knee-joint), which is liable to be tubercular in perhaps a larger percentage than any other joint. Deformity becomes very marked at an early date, the leg is very apt to be luxated backward, rotated outward and in genu valgum position, and both pseudo-arkylosis (adhesion of the ends of the bones by connective tissue) and true ankylosis (solid connection of the cartilages (e. of the bones) are frequent.

Inflammations of the molte- and towarl-joints are mostly tubercular. They take a slow course in most instances, and result but surely in recovery unsattended by deformity, unless there be timely, either conservative, or operative, or combined treatment, which may save many a foot and life. Unfortunately, constitutional tuberculosis is a frequent complication, and death, therefore, is not incommon before even a local restitution can take place. The elbour-joint exhibits the same tendency to deformity and ankylosis, but is rarely the source of a hertic condition and of death. Early fixation in a sling and the application of either water-glass or plaster-of-Paris handages are indispensable, while the forearm and the homerus should be placed nearly rectangularly. The same position must be secured for the foot. In coxitis and gonitis the limb ought to be kept entirely or nearly straight.

Gene uniform (knowk-know) is the exaggeration of a normal disposition produced by a slight depression of the external parts of the articular surface, mainly of the thigh. This disposition is increased by the rhachitical softening of the bone (in later life to an eminent degree by the pressure brought about by the occupation of bakers, waiters, salessromen, etc.). The speedy cure of rhachitis is an essential preventive. A plaster-of-Paris support (which aught to be renewed every few weeks), made to dry while the extremity is gently flexed, procures a normal position while the bone is hardening under the influence of phosphorus, etc. The elastic length-garters, which have to a great extent taken the place of the circular ones, applied below or above the knee, must not be tense, for in that case they increase the external concavity. They ought to be worn on the inside of the thighs, or both inside and outside. In had and chronic cases toteotomy is performed above the condyle of the femur (Macewen), also on the diaphysis of the tibia, and the bones are then allowed to beal in extension. Gena curron is almost always the result of a rhachitical outward curvature of (and below) the epiphysis of the tibia. It is but rarely that the femur participates in the deformity. If it be noticed in time, straightening can be effected before the parts harden. After this has taken place, outcotomy or osteoclasy must be resorted to.

Per turns (club/not) is often congenital. Defective supination is normal in the forms, and becomes exaggerated by the pressure of the uterus when amniotic liquor is scanty. In many cases there is at birth a deformity of the talus of such a character that its nock is long externally and the head turned inward; also of the calcaneum, whose anterior process is raised and articulations somewhat dislodged. According to H. von Meyer, the posterior tibial transfe is always primarily affected. The paralytic variety of club-foot results from immobility of the extremity, caused by complete paralysis or by some other sickness necessitating protracted rest in bed, or from paralysis of the extensor muscles of the lower extremities consequent on poliomyelitis. The deformity is an equino-varus rather than a more varus. With proper timely precaution its development may be avoided.

As the articulations begin to suffer at a very early period, and growth is very rapid, treatment should begin at once. Indeed, the foot which is birth is seventy-five millimetres in length, is one lumdred and seven millimetres after a year, 1223 millimetres after two years, and 1364 millimetres after three years. There is an increase of forty-three per cent: in the course of the first year; this increase is the more rapid the younger the infant. After three months the foot has added one-seventh part to its original length, and another ninth in the second quarter. Therefore, recovery from a moderate degree of club-foot, when treatment begins at birth, will take three months; when after a year, twelve months.

Manual correction with massage must be resorted to many times during the day. At night the tender foot of the newly-born hears quite well a pasteboard splint, well lined, and strapped with a snug handage. Later, or in procrastinated cases, a plaster of Paris bandage, or one of water-glass, or of peroplastic felt modelled around the foot and lower two-thirds of the leg on its inner side will be required to preserve the normal position. As there is occasional ascesthesia of the surface, great care must be taken lest undue pressure be exer-After the above treatment has had a satisfactory effect, Scarpa's, Stromeyer's, Sayre's, or any other shoe which permits of walking should be used. Tenotomy is required in a great many cases, -either of the tendo Achillis, or the anterior tibial, or the plantar aponeurosis, or several of them at the same time. The open operation of A. M. Phelps (preceded by Alfred C. Post) has gained many friends. He cuts all the layers of the soft parts at the sole of the foot successively, avoiding the ramifications of the plantar nerve, and occasionally incising the articulations of the talus and of the navigular and internal cuneiform hones. Healing takes place under the moist blood-clot. The paralytic muscles require persistent use of both the interrupted and the continuous currents. The function of the muscles can be improved, provided the patience both of the physician and of the patient is equal to the necessities of the case. Elastic straps may be so arranged as to sustain or replace the normal muscular function.

Pas equinus is the result of paralysis, either local, or spinal, or cerebral, and is complicated with atrophy of the muscles of the calf and of the sole of the foot, the tole becoming concave and the tors pointing downward. Here also tenotomy of the tendo Achillis and of the plantar aponeurosis, together with the employment of electricity and galvanism, are indicated. An apparatus is required to lift the americe part of the foot, and while the patient is lying down or sitting up, soon after the operation, he may practise upon a band properly attached to temporarily restore the normal position. Children will easily learn to look upon the exercise as play.

Pes calcaneus in a mild form is often congenital and sometimes complicated with pes valgus. The desirable position is restored by a shoe supplied with a high heel and so constructed as to press the foot down.

After Albert had accomplished, in 1877, an artificial stiffening of the joint, which should be considered a last resort only, by his arthrodesis. Nicoladoni introduced the shortening or transplantation of (not necessarily the same) tendons.

To heal a talipes calcaneos with paralysis of the muscles of the calves, he severed the peroneal numcles behind the malleolas and the tendo Achillis above the heel, and joined the central ends of the peroneal tendons to the stump of the tendo Achillis. Pocas, in a case of paralytic per valgus, connected the tendons of the extensor hallness

longus and of the paralyzed anterior tibial. Ghillini, to supplant the action of the paralyzed anterior tibial muscle, cut the tendon of the peronens longus near the cuboid bone, also that of the anterior ribial see centimetres above its insertion, and joined both by suture, with satisfactory result. Tendon grafting and muscle transplantation for deformities following infantile paralysis have been practised succeisfully. S. E. Milliken (N. F. Med. Rec., November 28, 1800). reported on fourteen operations performed on nine patients. They were transplantation of the sartorius into the sheath of the quadriceps, the joining of the extensor hallness longus to the paralyzed tibialis anticus, of the gastrocnemius to the peroneus longus and bervis, of the extensor digitorum communis to the tibialis anticus and play tyrag, of the extensor hallucis longus to the extensor digiforum communis, of the flexor ballucis longus to the tibialis anticus, and of a part of the deltoid to the tendon of the paralyzed triceps. Many successes have been scored since.

Pes culpus (flat-fost) is not infrequently congenital, the talus being found downward and forward. In other cases the deformity is rhachitical. Both to prevent and to cure it, antirhachitical treatment and temporary rost are demanded. There are also (rare) paralytic cases occasioned by paralysis of the supirator mascles of the foot. In these electrical treatment and the subentaneous use of strychnine, together with massage of the calf and of the sole of the foot and stimulating embracations and friction with cold or hot water, will render service. In all severe cases walking should not be permitted until a reasonable time has elapsed; the lower extremity should be raised, symptoms of vascular irritation referred by applications of cold water, and a nomial position should be enforced by plaster-of-Paris bandaging, which must be continued through weeks or months. When walking appears to be again permissible, the inner margin of the foot must be raised by thickening a part of the sole of the shoe, or by elevating it by springs which are elastic enough not to injure by pressure. I Wolf insists upon not resting the patient at all, but suckes him walk immediately after the application of plaster of Paris.

From a practical point of view, the subdivision of acolious into three varieties is an follows: the first degree comprises those cases in which suspension of the body removes the deformity altogether; the second, those in orbits this effect is but partially attained; the third, such as are not influenced by it. The prognosis in the first is favorable; in the around it is fair when the growth of the skeleton is not completed; in the third it is not good, but should not be considered absolutely bad. It greatly depends on whether the scollosis

results from a relative or an absolute insufficiency of muscles, or whether it is caused by a deformity of the vertebral bodies. The former may be either simply local in the muscles or depend on central paralysis, in poliomyelitis, in Friedreich's disease, and in some cases of progressive muscular strophy. The latter may be congenital, but is frequently the result of rhadditical softening later. In such instances a thorough antirhachineal treatment, with proper food and largiene and phosphorus, must not be postponed a single day. The habitual scolosis of the first eight or ten years is of merely museular origin, and mostly total and universal; the convexity generally to the left, and not often lumbar. This condition is found in bables who are persistently carried on the left arm; in school-children who rest the left arm on the table while the body is accommodating itself to the book and leans to the right; in girls who approach the bench sideways and pick up their shirts under the right gluteal region. The danger of becoming scoliotic is particularly great in those school-children whose sight is defective. Those who stand a great deal and carry the right shoulder forward develop a right doesal with a compensatory left lumber scoliosis. The prevention of all varieties consists in the avoidance of their causes. A baby must not be persistently carried on one arm: a mether is more apt to obey this rule thus a murse. The muscles must be exercised at an early age,-simple demestic gymnastics, but not overexertion; and the habitual use of cool or cold washing once or twice a day, with good food and air and plenty of sleep on a hair mattress, are indispensable. The school lessons ought not to last more than twenty or at most forty successive minutes; there must not be too sunny of them; there should be ample light from the left side while the child is studying or writing; defeetive sight must be corrected by glasses; the chairs or henches should he supplied with a support up to the lower dorsal region of the spine. During school sessions a light cornet may also be worn, and at night an apparatus to restore the equality of the two sides. Massage of the defective side and of the muscles in general will add to the good effect, and the concave side of the chest may be exercised by the enforcement of the habit of deep inspiration while the hand is firmly planted and pressed on the convexity. Systematic exercise and strengthening of all the muscles of the hody by appropriate gymnastics, particularly is well-directed institutions, are greatly to be recommended.

In more obstinate cases the foot corresponding with the lowered hip may be raised by thickening the sole of the shoe. Volkmann recommended the raising of the chair or bench under the dropping hip. Sayre's corset is either worn constantly or is made detachable. Rauchfuss's apparatus is so constructed as to leave the defective side but little or not at all supported while the patient is lying down.

The hyphosis of feeble rhachitical children requires general antirhachitical treatment. The baby must not sit up until the muscles have become stronger; the bed should have a hair mattress; and the patient must take the air while being carried either on a hair mattress, or in a wire cuirass, or in a tin or pasteboard or sole-feather mould sufficiently lined to be comfortable. As the baby grows, walking must not be encouraged. He will rise when his bones are hard enough and his muscles sufficiently strong.

XIV

Diseases of the Ear

Multicrostions of the ear, both external and internal, are mostly the results of arrests of development, and are but rarely amenable to improvement by treatment. A faulty position of the attrice may be corrected after birth; when it protrudes undirly, bondages or adhesive plaster, worn for a number of weeks, will keep the organ or a more normal position. Obstruction of the auditory canal by either an epithelial or an organized membrane can be relieved; the former demands a motal probe to perforate it; the latter, a croesform incision and removal of the flaps.

Foreign bodies are common in all accessible cavities, which prove frequent receptacles for shoe-huttons, heads, peas, beaus, etc.; sometimes their removal is very difficult; vegetables swell and thereby totally obstruct the meatns. The use of probes during examination is sometimes decisive in regard to diagnosis, sometimes very deceptive; the reflector is indispensable. The secretion of secondary ratarrli must first be removed by syringing and wining; pinorts will remove a body which is not tightly incarcerated; a David spoon, or the blunt end of a hair-pin bent upon itself, or a sharp spoon is often required for peas and beans. While the attempts at removal are going on, the ear ought to be frequently injected with warm water to expel shreds and blood and to facilitate inspection. Before the operation is begun, a cocaine solution may be instilled into the ear. A spray of ether may be demanded, and in urgent cases anaesthesia by chloroform: for, the extraction of a foreign body being paramount, even pieces of bone have to be removed sometimes to render its expalsion possible.

Living bolics, such as insects, will die in water, oil, alcohol, or a two-per-cent solution of carbolic acid. Dried secretion, or orrangen, is softened by filling the ear with oil or glycerin and springing forcibly with soap and water. The after-treatment may demand all the requisites of the therapy of inflammation,—rest. cool and dis-infectant applications, erect posture, and marcotics.

Othis external (inflammation of the external auditory canal) is the result of irritation by foreign bodies or by clean or dirty fingernuils, brushes, and sponges, also of the frequent use of ear-spoons, or of exposure to a high wind or draught; or it may depend on eczenia which extends inward from the neighboring surface. Gonococci and tubercle bacilli have been met with in the external ear,
diphtheria not infrequently; dirty bothing water is probably a more
common cause of ear disease than is generally supposed. Now and
then external offits complicates internal, particularly in infectious
diseases such as measles and scarlet and typhoid fevers. The general disposition to scrofula—that means to subscute or chronic inflammation of the tissues with rapid disintegration of the surface epithelitim and insufficient tendency to reparation—is a frequent factor in
the production of external ear disorder, and requires constitutional
treatment. Preventive measures are indicated by the causes enumerated above. Foreign bodies must be looked for and, if present,
extracted.

The three forms of external othis are the erythemators, the caturrial, and the phlegmonous (including the foruncular). The first exhibits a general reducas, and produces scales rather than secretion. An occasional application of lead wash, or lead outment, or zinc comment, or hismath earbonate, finely powdered, will be all that is required in the average cases. Where the reduces is marked and angry, with a good deal of fiching, the cintment should contain five per cent. of tocaine; or a watery solution of cocase bydrachlorate (from two to six per cent.) or a fresh suspension of adrenal substance in water (1 to 10) may from time to time be brushed over the sore surface.

The catarrhal form of external otitis is by no means a uniform or always a mild affection. There may be pain, also secretion of a simply catarrhal or of a malodorous (fat acids) or cheesy nature. Erosions, ulcerations, and swelling of the neighboring lymph-hodies are quite common. The integument is sometimes greatly swollen and now and then granulating; below and behind polypoid excresornces the bone may be affected; through the defective ossification (sometimes persistent) anteriorly and inferiorly, fistalle may form in the parotid region and even in the maxillary joint, and pus may find its way along the incisura Santorini through the cartilaginous floor of the meatus. The drum membrane is frequently affected. Every form of oryongitis is met with, from a slight hypersenia to thickening and turbidity of the membrane, even to perforation. Thus, there is every reason for early and persistent treatment. In the interest of examination, the speculum must not be used at first, except in older and very docile children; it annoys, pains, and frightens, and is seldom as useful as in advanced age because of the horizontal position of the young drum membrane, only part of which, at best,

can be seen. The secretion must be removed by syringing both frequently and forcibly (but the current must not be directed to the drum membrane) while the head is inclined so as to allow the instantaneous egress of the fluid. The injection fluid may be warm water, your and water, salt and water (6 or 7 to 1000), or mild astringent solutions of lead acetate, zinc sulphate, tannin, or alam (1 or 2 to 200); or the secretion may be removed by tufts of absorbent, or horated, or salicylated cotton, which are held tightly in a pair of pincers and not rubbed hard against the wall of the canal. A saturated solution of horacic acid (four per cent.) is both mild and slightly disinfectant. Boraric acid finely powdered may be thrown in so as to fill the canal after it has been thoroughly dried. When the renewed secretion has liquefied the powder, after a few or many hours, they are both removed by cotion or by injections, the ear thoroughly dried, and boracic acid introduced again as before. Mercuric bichloride (1 to 5000) injections may be given several times a day, mainly when there are much hyperamia and infiltration, in any of the varieties of external oritis; warm fomentations of the same solution should be made persistently. Two daily applications of carbelic acid in glycerin (1 to to or 20) have also been recommended; I believe they frequently irritate and fret the surface. Polygoid granulations have been removed by ligature. Chromic acid is liable to deliquesce so much, even when used carefully and in small quantities, as to endanger the drum membrane. The solid stick of silver nitrate is saler, and requires for neutralization, after application, only a salt-water solution. A daily trucking with hig ferri perchlorid. or liq. Jerri subsulphat, is very effective and quite sale. Biedert recommends hydrargyrum sozoiodolate. In external otitis leeches are seldom required, and then only when there is an excess of swelling. To relieve local pain and tension, cocaine solutions act better than do those of morphine. The oleate of morphine irritates the sore surface. Internally, a dose of morphine or some other opiate, or chloral, may become necessary. The patient must be kept in a semirecumbent or almost erect position, on a cool pillow, in every catarrhal or inflammatory condition of the ear. Cases of external oritis with copious secretion, complicated with or dependent on eczema, are greatly benefited by one or two daily applications of a small quantity (well rubbed in) of mercuric bichloride in landin (1 to 200 or 500). In obstinate cases of eccenta a solution of silver nitrate (1 to to or to) may be henshed over the parts once every few days, or Lassar's paste may be used (zinc oxide and amylum 38 ax, salicylic acid 1, white vaseline (a), which need not be removed when a new application

is made; or an ointment containing pure tannic acid and glycerin, at a parts, which are mixed thoroughly, and to which are added fat 30 and carbolic acid o.t parts.

The phlegmonous form of external otitis is mostly recognized with facility; the pain is intense, the swelling marked, more or less local, circumscribed, and red. Before an incision-which ought to he made in time-appears advisable, applications of solutions of hydrargyrum bichloride (a to 5000 water) are better than warm fementations. As stated, incision must be made soon and will relieve quickly. The Juruncular form demands at once either an incision or carbolic acid treatment. Both should be preceded by local cocaine or ethyl bromide anaesthesia, for the pain may be intense. The incision must be as thorough as in a furuncle of any other region. It may often be substituted by a thorough application of concentrated carbolic acid. If applied early, a single (or repeated) application will prove effective. As its action is quite local, when used carefully there is no danger. If the furuncie he pointed and the surface excessively painful, the acid ought to be introduced into the centre of the swelling by means of a slightly curved probe.

Accompanying asyringitis is age to improve after its cause—the office externs—has been removed. A vesicatory or fincture of sodine on and about the masteid process is helpful. Direct injury of the drum membrane by cold water or salt water during bathing can be averted by a wool tampon.

Othis surdis, both the catagrhal and the purilent varieties, is a very frequent disease in infancy and childhood. It is asserted by some that it is found in seventy per cent, of all nursings, which is an exaggeration. The great vascularity of the mucous membrane of the middle ear furnishes a ready disposition. Even in the middle car of the newly-born accumulations are met with which either constitute or dispose to otitis. According to some, the masses frequently encountered consist of detritus developed from the fortal epithelial covering; others accuse aspiration during and immediately after hirth; some attribute pathological changes to ordens produced exvueno, the various being due to the sudden separation of the inucous membranes formerly closely adjacent to each other. Infants have a large, short, more horizontal Eustachian tube, with a funnel-shaped pharyngeal aperture; thus infectious material of the common eruptive fevers, streptococci and staphylococci, the bacilli of a diphtheritic rhinitis, and even gonococci find easy access. Most frequent are the diplococcus Fraenkel and the staphylococcus pyogenes allors; strentococcus impairs the prognosis. On the other hand, pus has an easier

egress from the cavity, even during the sucking movements; that is why otitis media may run its full course without apparent local symptoms, and wity obscure fever, sepsis, or atrophy should rouse the suspicion of occult car trushle. Perforation of the dram membrane does not occur in such cases. In Jobular pneumonia editio media is quite frequent, still more so in croupous puenmonia; in scarfatire, also in measles and typhoid fever, it may be very severe. All the varieties of masal, pharyngeal, and maso-pharyngeal catarris, also adential vegetations and hypertrophied tonsils, are known to be frequent causes of middle-ear disease. Vehiment spells of whoogingcough, forcible medicinal or other injectious into the nares, and violent socraing, coughing during pneumonal, coniting, or finger contact during gastro-enteritis are ape to carry foreign material into the Eustachian tube and middle cur, particularly when the uvula is congenitally split (bifida), and shill more so when the hard palate is fissured or when there are adenoids which impede pharyago usual ventilation; for in such a case the levatores palati have no support and the muscles of the tribs are insufficient and atrophiol-

Preventive treatment has a wide scope. The number of cases of otitis media-according to Schwartze, twenty-two per cent, of all diseases of the organ of hearing are purulent forms of middle-sar disease-is as significant as its causes are manifold. Nasal, postmasal, and pharangeal enterths must be attended to in their incipiency. Regular attention to the nose of infants would prevent much disease and many calamities. Indeed, defective bearing is more common than we suspect. Bezold found (1886) that of nineteen hundred and eighteen school-children, rwenty-five per cent, had but one-third and cleven per cent, but one-fifth of normal hearing distance, and his statements have been amply confirmed by many more recent observers. Most cases of perforation of the drum membrane, chronic supporation, abscesses in the masteid process, permanent paralyses of the facial nerve, and cerebral abscesses can be prevented by treating and curing the origin and formatin-head of the future distress. The hypertrophied mucous membrane of the nose must be reduced, adenoids removed, and enlarged tonsils resected in time. The mterior of the nose, at least of every infant or child with a tendency to nasal or pharyngeal catarrh, ought to be washed-irrigated-at least once a day, according to known principles (p. 410), but very, very gently. Gentle insuffation of the nancs will clear the ravities of nineus. It may be done by a Politier apparatus (no simultaneous deglutition is required) or by blowing into a soft-rubber tube introduced into one nostril, while the other is kept open. There is better reason, from the point of view of danger to health or life, for washing the imode than the outside.

A child with an acute attack of middle-car disease ought to be in hed, the head raised. The symptoms are not always argent or easily recognized. In the very young the large size and shortness (p. 519) of the tube facilitate the exit of the internal secretion into the threat, so that the drum membrane is not amoved and pain from internal pressure and irritation is insignificant in many instances. Careful examination, however, will leave a doubt as to the actual seat in few cases only. A mild antipyretic, a small dose of a narcotic, or a purgative will ameliorate the symptoms. In the very begiming the Eustachian tube ought to be treated by inflation (Politzer) very carefully, if at all; older children, who can be taught the use of Valsalva's method, must be warned against its excessive and vehement employment. When the acute stage has passed, both are mostly indicated. The severe pain may be relieved by a cocaine solution (2 to 10 or 100) instilled into the ear, also by one or more leeches to the mastoid process of the affected side, in most cases but one side being diseased. In mild ones tineture of iodine alone will suffice. When the dram membrane is red, a cloth moistened with a solution of hydrargyrum bichloride in water (1 to 5000), applied to the ear and frequently repeated, will, after getting warm, do equally as well as the most favored warm poultices. When secretion of mucus or pus is increasing inside, the posterior half of the drum membrane is nushed out first, afterwards the anterior; between the two, particularly in older children, the hammer can be distinguished. A spontaneous perforation is apr to form in the anterior portion, but the presence of a white discoloration does not always indicate pus. When the protrusion of the membrane is very marked, an incision should be made, mostly posteriorly and inferiorly. The general opinion of experts, however, is no longer in favor of indiscriminately early operation; still, when it is performed, the inciden ought to be sufficiently large. Pus is then expelled by inflating through the nares. (Politzer), and wiped out or carefully stringed out with a warm solution of table salt or of horacic acid (3 or 4 to 100). The patient should rest on the diseased side. Borneic acid is then used as described in the rules laid down for its application in external otitis, or the canal. is gently syringed with a mild solution of hydrargarum bichloride (1 to 5000), or of an astrongent,-zinc sniphate (1 to 500). To what extent, during all this time, narcotics are to be used, or whether amesthesis, local or general, ought to be employed, depends on the individual case and the judgment of the practitioner; also whether

an antiscrofulous or antisyphilitic treatment (the latter but rarely in children) be demanded. Chronic discharges require politerization frequently, though cautionsly, and the use of boracic acid and astringents; secondary polypi, treatment similar to that detailed above.

The secondary affections of the masteal process demand leeches, ice, and tincture of iodine; where there is sedema, warm poultices and a deep incision. Abscesses of the masteal process and of the brain response timely operation by an expert hand. The general rules laid down by Tröltsch are still valid. Cercinal affections due to car discuse are, when originating in the external meature and the temporal bone, in the transverse sinus and the cerebellum; when in the middle car, in the cerebrum; when in the vestibule and cochles, in the medulia chlongata.

According to many, the antrum should be opened and cleaned out for the purpose of discharging pus both from the antrum and the middle ear. In that way secondary operations are avoided. Contrary to this general practice, A. Politzer expresses the belief (Text Book, 4th ed., 1901) that it is sufficient to open the abscess and to remove its osseous wall, as far as it is softened and covered with granulations, without opening the antrum. The latter operation be recommends only when the wall between the empyema and the antrum is thoroughly softened, or when there are symptoms of an epidural or a cerebral abscess.

Operations require especial knowledge, dexterity, and caution when made on infants and young children. There are no mastoid cells yet (H. Knapp, Jour. Amer. Acro., February 23, 1901), but a presumatic cancellous tissue in the base of the squama; that is why abscesses are found above rather than behind the ear. Besides, between the bows there is autural substance; the roof of the middle car near the third temporal lobe is in part membraneous.

In my opinion, one of the most important additions to modern surgery is our knowledge of the operative accessibility of all the spaces and nooks of the middle ear, as taught by Schwartze, and of the epitympanic part, by Zanfal, in all cases of chronic suppuration of the middle ear accompanied by sensitiveness or suppuration on the surface of the mastoid process, or by fistules, with osseous stenosis of the mentus and facial paralysis; of middle-ear disease exhibiting cerebral symptoms, with or without persistent favor, though there be no external inflammation; also in cases of cholesteatoma of large size, with alarming cerebral symptoms during the operation, particularly while injections are being made, or in those in which sequestra or foreign bodies must be removed, mainly when they give rise to brain symptoms; and, lastly, in cases of profuse ichorous secretion, or of actinomycosis, or of tuberculosis of the middle ear.

Deaf-mation is rarely a primary affection of the organ of hearing, though arrests of development and the results of feetal inflammations are not uncommon. It is also found in many instances of cretinism. It would be better in a large percentage of cases to assign it a place in connection with diseases of the nervous system, for most of both the congenital and the acquired cases result from cerebral affections. It is not often hereditary. If more extensive statistics prove its (very doubtful) dependence on consunguineous marriages, a wiser social hygiene can be made to act as a presentive. Alcoholism of the parents is a cause, and society and the state, with its organization of ignorance and disorder, are responsible for somuch of deaf-mutism as is not unavoidably pathological. About half of all the cases are acquired, some even after children commence to talk, the majority of them through cerebral and cerebro-spinal inflammation. According to Biedert, fifty-five per cent, are of that class, twenty-eight per cent. depend on acute infectious diseases (typhoid, scarlating, and diphtheria, also variola and measles), 3.3 per cent, on traumatic injuries, and 2.5 per cent, on ear affections. Thus many of the congenital cases and most of the acquired are preventable. The treatment must be directed to so much of pathological change in the brain, the acoustic nerve, or the ear as is still accessible to the influence of either remolial or operative interference. Chronic (mostly interstitial) inflammations of the brain should not be given up as incurable so long as mercury and the fodides have not had sufficient opportunity to show their absorbent powers during a protracted administration. External and internal otitis, naso-pharyngeal catarrh, hypertrophy of the tossils, and adenoid vegetations should be attended to in time, though these affections appear over so slight.

XV

Diseases of the Eye

Malformations of the eye are of different variety and gravity. Some cannot be corrected, such as cyclopic, microphimissia, and obstitutions, some need no correction, like the common (vertical) form of colodowar of the iris, or the congenital atreass of the pupil. The latter consists in the persistency of a part of the popillary membrane originating from the posterior aspect of the lens, and, if still extant after birth, disappears slowly. Others require, and are corrected by, operations *Bficonthus—an abnormal accumulation of cutin near the root of the nose—may be removed by an operative procedure, in the event of its not gradually disappearing spontaneously.

Neoplasmu of the eye and evelids are not frequent in infancy and childhood. Congenital nami of every variety, however, are not uncommon. Very americial ones on the exclids should be kept under observation. When uniform and rather pale, they are liable to heal spontaneously. When a net-work of unlarged blood-vessels is found on the fids or conjunctiva, there is often a central point the compression of which by means of a silver probe empties all the neighboring branches. This centre ought to be destroyed by a single application of the thermo- or galvano-cautery, or by a trace of finning nitric acid, or by running a sterile silk ligature underneath and tying it. When they form small or large himors (sometimes only diluted bloodvessels, at other times angiomata cavernosa), in most cases the artial cantery is easier and safer than the knife. The cantery must be used carefully and sparingly,-too little rather than 800 much, according to rules detailed above,-and always with a view of avoiding a consecutive ectropion.

Dermoid cyric are found on the lide, inside; also on the eyeball; even in the orbit, from which their removal is rather difficult. They must be enucleated when the diagnosis is undoubted. They have been mistakenly diagnosticated in cases of encephalocele of the interior angle of the eye.

Lipowe is very rare, still more so than cynticircus collatora. A few instances have been reported in which this cystic degeneration of the owns of the tenia solium was found in children in the posterior chamber and under the skin of the lid.

Choloxion (not always tubercular, as has been asserted) is a

mucous cyst in the tarsal cartilage, with a tendency to infuration. The cyclid is turned over, the small tumor incised, its contents scraped out, and iedoform applied once. As the wound is covered by the lid. it heals rapidly.

Gliowa of the retina (Beer's amaurotic cat-eye) develops rapidly. Its vascular, sometimes red and bleeding, surface distinguishes it from suppuration of the vitreous body. It must be enucleated at once, as it is liable to grow rapidly in every direction.

Syphilitic gusumete have been observed in some cases of retarded syphilis. They exhibit the symptoms of iritis, and require an antisyphilitic treatment.

Tubercles of the iris are, fortunately, rare. They give rise to an incurable chronic iritis and necessitate emcleation of the cychall. Tubercles of the choroid are sometimes observed in the incipient, sometimes in the advanced stage of inhercular maningitis. They are not considered amenable to successful treatment. But a case of tehercular meningitis with tubercle of the choroid was described lately. It recovered.

Foreign bodies hidden under the eyelids must be removed speedily. for conjunctivitis will immediately follow their presence. They are often washed out by the copious secretion of tears. The lower syelid. may easily be turned out and the corresponding portion of the conjunctiva inspected. The upper requires turning up, which is more difficult because of the resistance of the child, but easier than in an artist, on account of the greater motility of the skin of the young cyclid. To facilitate inspection, the eve may be gently pressed backward into the orbit. The body, when seen, is removed by pincers, a fine sponge, a piece of gauze, or wiped off in the direction of the nose. In case, of necessity, aniesthesia may be procured by a drop of a two-per-cent. solution of cocaine. This is indispensable when the foreign body is in the cornea and demands instrumental removal. If it be iron, a strong magnet will remove it; when it is located externally, without, when in the deeper tissue, with, a previous operation. The danger connected with foreign bodies entering the cycball, and the indication for issuediate, or delayed, or no operation depend on the condition of the foreign body, which may be aseptic and not injurious, may irritate mechanically or chemically, or be infectious. As a general rule, the foreign body is readily recognized in the anterior chamber, the iris, or the lens, and should be removed immediately according to the rules laid down in ophthalmological works

Jujuries of the eye by puncturing, entling, blows, etc., require absolute rest, the removal of foreign bothes, the application of ice,

of atropine solution (escrine when the wound is periphenic), and gentle pressure. Bad cases of laceration and destruction are either irremediable or require special, perhaps operative, treatment.

Lachrysial stexosis is apt to correct itself with the development of the nose. Probing under other has been recommended, and an astringent wash for the conjunctiva, with massage of the sac.

Burns should be treated on general principles. The effect of acids is best counteracted by copious irrigation with water and cooling applications afterwards; of lime, by oil (not by water), the cureful removal of the foreign body, and ice applications.

The cyclids suffer from blephavitic mostly in scrofulous children. in whom dust, smoke, and infections of all kinds are apt thoroughly to influence the superficial tissues. It often accompanies eczeniators cruptions of the head and face, and is frequently carried by the fingers. Therefore, soap and water, a nail-brush, and cutting the nails short are good preventives; so is the successful treatment of the head and face. The Mepharitis and conjunctivitis of measles require no special local treatment; the common forms do well with zinc ointment, or one of the yellow oxide of mercury with vaseline (1 to 50 or 100). The secretion must not be permitted to get dry. Hard crusts are dissolved by a warm solution of sodium carbonate (1 to 100 or 200) or by frequent washing with soap and water. Grave cases demand epilation of the cyclastics, every one of which-so far as required-must be caught singly and drawn out slowly enough to secure removal of the entire hair. Ointments and solutions of lead it is best to avoid, for complications with corneal erosions, grave or slight, are very frequent in affections of the cyclids and conjunctiva, and even the slightest ones may be indelibly stained by lead salts.

Both the integuments and the connective tissue of the syelids being of loose structure and expansible, ordena is quite frequent. Insect bites are mostly diagnosticated by their circumscribed and pointed appearance: cardiac and renal diseases require their own diagnoses and have their own indications, so has hydramia from whatever cause, besides the indications for the administration of iron, quinine, or arsenic.

The conjunctiva is very liable to be affected by medicinal and poisonous agents. According to Silbertean, anilin, potassic chlorate, and corrosive sublimate produce thrombosis; pungent gases, conjunctival hyperamia and conjunctivitis; antipyrin, urticaria of the cyclids; copper arsenite, redness and corrosion; hydrogen arsenide, a brownish-red or interio discoloration; potassium bromide, simple or phlyetenular conjunctivitis, without, however, influencing the blood-vessels of the interior; chrysarobin, a local inflammation; conine, a burning sensation; ergotin, hemorrhages; potassium iodide, inflammation; iodoform, when applied locally, an erysipelatous tumefaction; and sodium salicylate, ordens and a bluish exauthema; in larger doses, tumefaction and vesicular eruption. Still, cases of conjunctival disease depending on these agents are comparatively rare.

Microbes are common in eatarrhal conjunctivitis. In the newlyborn cocci and diplococci are frequent (p. 107), in the adult diplotocteria.

In a number of cases of conjunctivitis the conjunctiva of the bulbus does not participate extensively. Common forms of fevers, also whooping-cough and principally measles, are among the causes of acute conjunctivitis. Sometimes there is but little redness; the lids are thickened and stiff with redema. In other cases there is plenty of mucus, sometimes purplent, now and then with a tendency to coagulation, but not to such a degree as to render difficult the differential diagnosis from diphtheria of the cyclids. The mucous secretion must be wiped off with absorbent cotton or a moist cloth, a threeper-cent, boracic acid solution should be applied or instilled, and cold water employed at intervals of from one to ten minutes; chlorme-water, if obtainable fresh (a traspoonful in a glass of water), should be used for applications; if the surface secretes much, corrosive sublimate (1 to 4000 or 4000). If the secretion be parulent, where mitrate, 1 part in 100 or 500 parts of distilled water (black bottle), roust be applied once a day, best with a brush, and washed off with pure water. A high degree of congestion, with phlyctemilar symptions,-sometimes unilateral only, not infrequently combined with Mepharitis,-demands persistent application of cold, best by keeping a number of small pieces of cloth on a lump of ice and applying them at short intervals until they begin to get warm. Attopine sulphate (1 to 200 or 500) should be instilled once or twice a day, and the lide kept at rest. To hold them immovable, if the patient be very young, a layer of absorbent cotton should be covered with, or slightly scaled in, collodion and applied after the eye has been wiped dry. Later an ointment of the yellow precipitate of mercury (1 to 50 or 100), or calomel finely powdered, may be employed once a day.

Chronic conjunctivitis presents in many cases few symptoms only. The superficial hyperamia does not always correspond with the huming sensation often complained of, and the mucous secretion is but trifling and collects mostly in the inner angle of the eye. Overexestion

of school-children, particularly of those who are hypermetropic or astigmatic, diseases of the rose of a catarrhal or ulcerous rature, indigestion and constipation, anamia, scrofulosis, or trichlasis, are just so many causes and require the appropriate causal freatment, both medicinal and logienic, change of air (country), and cool and cold bathing. These measures often suffice to relieve even secondary disorders of the lymph circulation, which is easily disturbed. Like the orbits, which discharge their lymph-ducts into the deep facial lymphbodies, the lids and conjunctive are connected with the glands of the aural and submaxillary regions. The medicinal treatment is disinfectant and astrongent; the remedies must be changed from time to time. Zine sulphate (1 to 250 or 500) with or without cocaine muriate () or 2 to 100), in more protracted cases ointments of zinc or copper sulphate (t to 100 or 130), solutions of boracic acid (3 to 100). or of sodium carbonate (+ to 100 or 200), in suspurating cases a daily brushing with silver nitrate (1 to 250 or 1000), combined with sernpulous elegaliness and avoidance of vascular stimulants, will meet all indications.

The chemous of scleral conjunctivitie does not require any additional applications; mild astringents and rest will suffice. Rubbing, constipation, and coughing result in hemorrhagic discoloration (general blueness or extravasations) which requires rost and cool (or warm) fomentations.

Diphtheritic conjunctivitis cannot readily be mistaken. The infiltration is hard and the pseudo-membrane not removable. There is no secretion; indeed, the eye is dry to such an extent that the pressure of the exulation alone ulcerates the comea. Absolute custion in every case of—particularly masal—diphtheria, and covering the healthy eye, when (as usual at first) but one eye is affected, with a cotton and collodion application, aided by more cotton and a lundage, are indispensable. Thorough and speedy mercursalization and annovain are indicated. Papapotin (a to 5 or so of water and glycerm), not to be substituted by "papoid," may be applied every hour. Silver nitrate deserves no recommendation. Chlorine-water, carefully applied while the exclid is kept away from the cychall, whenever that is possible, may render good service. Ice must be applied carefully and persistently.

Most cases of gonorrheol conjunctionic are contracted during birth from the genococcal discharge of the material vagina; others through handlerchiefs, towels, fingers, or bothing water. Its treat-

ment has been discussed (p. 107).

Trackount, possibly of a microbic, surely of a specific character,

consists of granular deposits and proliferation of cells which crowd upon the normal tissue and render it atrophic. Its duration is long; its treatment must be persistent. The acute attack, or stage, requires daily benshing with silver nitrate (r to 100), and washing off with water when the first effect of the caustic becomes visible. The subscine cases demand a daily (or loss frequent) application of the copper sulphate stick. The granulations may also be scarified, seraped out, or supereed out,-on old operation successfully reestablished by modern surgery. Many cases do well with a daily application of one part of mercuric bichloride in one thousand parts of distilled water. The conjunctival duplicature, which is the pet seat of trachoms, has been excised to get rid of a large part of the discused musses at once. For domestic treatment, an ointment of copper sulphate and vaseline (x to 100), with or without cocaine muriate, will prove beneficial. A similar treatment, somewhat modified and dilmed, is applicable to what is described as granular commentations, which probably is in no case anything but a mild form of trachems. Follicular conjunctivitie is probably of the same nature in many cases; usually it is described as an inflammation of the (microscopically small) glands of the conjunctiva. The folicies are in rows near the margin of the evelids. It is complicated with, or depends on, the presence of foreign bodies, of nasal disease, or of other varieties of conjunctivitis, and is not infrequently found in large numbers in families and in schools. The treatment is milder than that of the previous forms,-rest, seashing, boracic acid solutions, astringents.

Keyatirir, beginning with a small vesicle, which is mostly not observed, and rapidly terminating in a superficial ulceration, is frepoently mer with in "scrofulous" children, who, besides, suffer from affections of the inncoos mombranes of the nose, lips, and ear, from oczemu, glandafar timefactions, etc. Some patients are rickety. To overcome the spasm of the conjunctiva, rocaine is often required to facilitate examination; for that purpose the dipping of the head esto cold water, a popular remely for photophobia, is probable not convenient. The constitutional disorder must be combated by cleanliness, fresh (country) air, bathing, plain and nouritious diet, quining in small, iodide of iron in proper dosss. Potassium iodide in small doses (from one to two grains), three times a day, given for a long time, is very successful in many cases. The room must be kept moderately dark and the ever protected by a shield. Good local applications are chlorine-water diluted in from twenty to one hundred parts of water. corrosive sublimate (1 to 5000), boracic acid (3 to 500), atrovine sulphate solution of one-half per cent, or cocaine muriate solution of two per cent. (the last two occasionally in combination). When the ulceration is near the corneal margin, eserine is recommended in place of atronine; but it is advisable to remember that it produces a congestion of the iris and may predispose the latter to be drawn into the morbid process. Obl cases will do well with occasional (one every day or two days) gentle applications of silver nitrate (1 to 200 or 500) or (particularly when the conjunctiva is pale) of finely powdered caloniel; this latter has always been highly recommended, and is useful, if persistently employed through weeks and months, when turbidity of the comes remains behind. Old cases with defective power of reparation will do well when the Eds and eyeball are gently kneaded with an ointment of the yellow precipitate of mercury (1 to 50). In many instances some of these remedies will act better than others; alternation is often required. A simple ulceration, no matter what application is employed, will heal better, or best, by avoiding friction of the eyelids; they ought to be immobilized by cautious handaging, which may be removed to make the demanded local applications. Under the bandage a cloth wet with a solution of corrosive sublimate (1 to 5000) or beracic acid (3 to 100) will prove quite acceptable and beneficial. Supporating ulcerations lead to hypopyon and perforation. They require, hesides atropine, or eserine when near the margin, occasional applications of corrosive sublimate (1 to 2000) or silver nitrate (1 to 100). Biedert recommenda cocaine and scraping or burning of the abscess. According to him, the main obstacles in the way of speedy recovery are: complications with conjunctivitis, blepharitis, rasal affections, stenosis of the lachrymal duct and blemorrheea of the lachrymal sac (but rarely its congenital obstruction), and blepharophimosis with photophobia and rhagades.

Parenchymerous or diffuse herutitis is a poculiar variety. The turbidity and thickening of the two comese (the process being bilateral) are extensive, not always uniform, often disseminated, and complicated with considerable vascular injection on and around the cornex and with synechia of the iris. Very many cases of this variety—according to some, the vast majority; ninety-six per cent., according to Parinaud; thirty per cent., according to Siklossy—are the results of syphilis, either hereditary, or acquired, or retarded hereditary. They require persistent antisyphilitic treatment with potassium indide (and mercury). Scrofula, rhachitis, malaria, and arthritis are also charged with producing this form. It is certainly true that indine and mercurial treatment are not always successful. Some cases are benefited by sodium salicylate. Atropine is useful in all.

In neuroparalytic keratific both the conjunctive and the comes are deprived of sensibility, the lids do not move, the eye is kept open, the cornea is dry (xeroxiz) and may undergo softening (kerstomalacia), with the result of either perforation or incurable turbidity and local thickening. It is observed in severe infectious fevers, particularly during the unconscious state of typhoid, and in the coma of encephalitis. These results are not often met with for a longtime in succession, for most of the patients die of the original disease. They have also been noticed during and after frontal and conjunctival herpes zoster. In all these cases the eyeball must be moistened with salt and water (6 or 7 to 1000) and the lids closed by a bandage or by cotton with collodion. In most cases the latter will prove as effective as auturing of the two eyelids. Xerosis of the conjunctiva is also noticed, in very young infants, as the result of ill matrition and consecutive marasmus. Most of the patients are from two to six months old. Proper and sufficient food will semetimes restore both the eye and the general health, but the mortality of these cases is very high. The same condition is found in children of from three to nine years (Thalberg, Förster). Several such cases were complicated with hemeralopia.

Keratocomus—the conical raising of the centre of the cornearequires a cautious thermo- or galvano-camerization; passus, the centre of which is generally absolutely deprived of blood-vessels, demands stimulation. Daily insufflation of finely powdered calonel, continued for weeks or months, has met with some successes. Infection with erysipelas and genorrhox has been observed to restore circulation and absorption, and the latter has been utilized, consequently, to accomplish these ends. An infusion of the seeds of lequirity (from three to five per cent.) has been used for the same purpose. Kobert prefers a one-per-cent, solution of its constituents, either abrin or ricin.

Acute tritis is rare in infancy and childhood; its complication with gloscome still more so. Of its two great causes, syphilis is almost exclusively of the hereditary variety, and rheumatism exhausts its main danger in starting endocarditis.

Chronic iritis is not so often seen in early life, except in connection with diffuse locaticis. The treatment of iritis is essentially identical with that of the same affection in adults: hydrargyrum, iodides, and salicylates, according to the causal indication; instillations of atropine sulphate in distilled water (1 to 100 or 500) from two to ten times a day, or oftener if the danger of adhesion be imminent, with a two-per-cent, solution of cocaine muriate if the pain be great; absolute rest in the acute variety, dry heat; a dark room; iridotomy, or rather iridectomy, in most cases to loosen synechie and restore a pupil. Subconjunctival injections of corrosive sublimate (a to tooo, a few drops at a time) were used by Darier in 1892, and in Deutschmann's clinic. They are made near the margin of the cornea and downward, and are recommended principally for syphilitic affections of any part of the eye, except, perhaps, the optic nerve, Parenchymatous beratitis and iritis are also said to be amenable to the same treatment, though they be not syphilitic. Later reports are not quite so favorable.

Supporative cyclins and a true observe of the nitrous body are generally found together. Blindness is imminent, and enreleation to save the other eye becomes a necessity in almost every case, except in small children. In them the process has often exhausted uself, and may terminate in blindness and contraction without secondary irritation. When the absence is small, part of it may be absorbed, and a white cloud in the lower part of the vitreous body, with feeble vision, may be the only evident results.

Uncomplicated inflammation of the choroid is rare in children, Idiopathic choroido-retinitis is observed in later years in both eyes after it has lasted a long time. It certainly commences at an early age, but takes decades before it ends in contraction of the field of vision, degeneration of the retina and optic nerve, and turbidity of the vitrous body and the posterior capsule of the lens. In all cases, whether syphilitic or not, treatment with mercury and iodides is the only one either reliable or advisable.

Congenital cutaract demands an operation if vision be insufficient. If it be partial, atropine and indectomy will suffice. Total cutaract is rare in early years, but it may affect a number of persons in the same family; it may also, in exceptional cases, run a rapid course. More frequent is zonalar cataract, which exhibits round its nucleus one or more turbed tayers, followed by normal clear ones. As at the same time in a number of cases transverse phosphatic deposits are found in the treth, zonalar cataract has been attributed by many to rhachitis; others connect it with consulsive diseases. Some constitutional disorder has been charged with being the cause, but no treatment has been advised, nor is there any apparent indication, except to correct the accompanying myopia.

Discuses of the retisu, the attic nerve, and the orbit show no particular symptoms in the young, nor do they require special treatment different from that employed in advanced age. In many cases of acute or chronic leptomeningitis with ample effusion, blindness depending on copious secretion in and around the tissue of the optic nerve is an early symptom. Early diagnosis of this condition, and treatment with mercury, inclides, and derivants (dimetics, purgatives, diaphoretics), may succeed in reducing the ordenn and preventing compression and atrophy of the nerve. A number of such cases will get well. Lumbar puncture, performed once or repeatedly, ought to relieve pressure. Retinitis albumination occurs rarely on one ejetedly. Once it was found on the left side, when there was only one (the left) kidney.

The tissues of the young eye being soft and elastic and expansible from internal pressure, glancons is tarely seen at an early age. Its place is taken by hydrophihaluses (huphthaluses), which requires the operative procedures employed for the glaucoma of advanced age,—either iridectomy or selectionsy.

Strabassus is common in infants during the first few months of tife. In them it is the result of an insufficient development of muscular power in general and of accommodation, and requires no treatment. That which makes its appearance during consulescence or in general hydramia terminates in recovery. Explitheritic paralysis of the muscles of accommodation recovers spontaneously, or through generous feeding and the administration of iron and strychnine. Muscular paralyses resulting from cerebral diseases depend on these for their treatment, if any be possible. The ordinary form of ophthalmoplegia, for instance, results from nuclear degeneration. Still, there are a number of hereditary cases reported by Gourzein and considered by him solely muscular. In them the posis was very marked; there were also nystagmus and some amblyopin. Persistent strabismus in children of five or six years requires the same methods of operative treatment as that of adults.

Nystegums is a symptom only. It is either of central (sometimes rhachitical) origin, connected with an intracranial pseudoplasm (and choked disk), or hereditary atavy; or dependent on locally diminished vision (affection of the cornea, lens, retina, or choroid); or on rotary spass. It may be combined with strabismus, and may be horizontal, vertical, or diagonal; on one or both eyes. Bandaging one eye will sometimes stop it: but the therapy is that of the underlying lesion.



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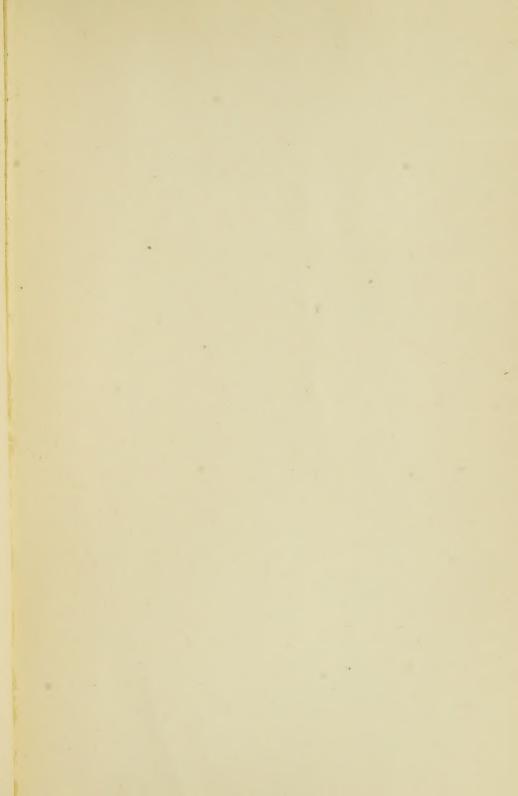
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